RAILROAD GAZETTE

FRIDAY, SEPT. 11.

CONTENTS.

ILLUSTRATIONS:	PAGE.
Improvements in Compound Locomotives	628
Shallow Bridge Floors	630
Continuous Rails	630
The National Surface Cattle Guard	631
"Multiple Speed," Railroad for the World's Fair	632
The Leland Heater as Applied on the New York, New Haven & Hartford	633
Ten-wheel Compound Locomotive—Southern Pacific Company	inset
Suburban Locomotives for the New York Central	inset
CONTRIBUTIONS:	
Cattle Guards	627
Reconnaissances in South America	627
The Forward Impulse of a Locomotive and the Position of the Wrist Pin	627
EDITORIALS:	
Locomotives for Suburban Traffic	636
Elevated Terminals in Chicago	637
The Argentine Situation	637
EDITORIAL NOTES	636–637–638
NEW PUBLICATIONS	638

GENERAL NEWS:	PAGE.
Locomotive Building	639
Car Building	640
Bridge Building	640
Meetings and Announcements	641
Personal	641
Elections and Appointments	641
Railroad Construction	642
General Railroad News	643
Traffic	644
MISCELLANEOUS:	
Technical	635
The Scrap Heap	639
Railroad Law	640
Some Pointers on the City & South London Subway	627
A Brooks Suburban Locomotive	629
Outing of the Western Society of Engineers	629
Canadian Railroads as Servants of the United States	631
Government Regulation of Railroads	633
Roadmasters' Association of America—Minneapolis Convention	634
Notes from the Bridge Shops	634
Steam Locomotives Supplanted by Electricity	634
Master Car Builders' Association Standards	635

Contributions.

Cattle Guards.

Norfolk & Southern R. R. Co.,
NORFOLK, Va., Sep. 7, 1891.

TO THE EDITOR OF THE RAILROAD GAZETTE:

Can the article on Cattle Guards, p. 613, Sep. 4, be accepted as the least promise of hope to an almost hopeless despair engendered by hogs that find no obstruction in any of the forms of surface guards, metallic or otherwise, that I have so far been able to buy? Is it a forerunner of any new design, or simply an expression of needs known full well?

M. K. KING.
General Manager.

[If Mr. King will turn to another page in this issue he will see a big ray of hope shining out. The "razor back" is hard to stop; but a harpoon in his leg will probably do the business. We say nothing of the humanity of the contrivance, but humanity is relative after all.—ED. RAILROAD GAZETTE.]

Reconnaissances in South America.

TO THE EDITOR OF THE RAILROAD GAZETTE:

In the interest of geographical accuracy I am sure you will welcome a correction of certain statements which appeared under the above caption in your issue of Sept. 4.

It is true that engineers are drawing plans, in the interest of the Peruvian Corporation, for the improvement of navigation on the Rio Desaguadero, but it is not true that "This stream will afford to Bolivia an easy exit to the sea by the Amazon." The fact is that lofty ranges of the Andes lie between the Rio Desaguadero and the water shed of the king of rivers. The navigable Bolivian tributaries of the Amazon are many hundred miles to the northeast, and even these are cut off from communication with the lower reaches of the Amazon by the long series of rapids in the Rio Mamoré and the Rio Madeira.

The Desaguadero is one of the most remarkable rivers in the world. It is the outlet of Lake Titicaca, and flows southward about 240 miles through a narrow valley in the great Bolivian plateau at an average elevation of about 12,000 ft. It here spreads out into a half marshy lake, known as the Lago Pampas Aullagas, part of which is brackish. There is no outlet from this lake to the sea, all the outflow of Lake Titicaca being here evaporated. In 1846, and at a few other periods, owing to excessive rain around Lake Pampa Aullagas, the current of the Rio Desaguadero was reversed, the water flowing northward into Lake Titicaca for a few days. At low water the river has a depth immediately below Lake Titicaca of about two fathoms, but on account of its sluggish current it has silted up so that this depth rapidly diminishes southward.

The improvement of this waterway will afford opportunities for increased traffic with the cities of La Paz, Corocoro and Oruro, and will facilitate the opening up of large mines of copper and silver. It will, however, be only a partial relief of the necessities of the region, since neither of these cities is directly upon the river, and connecting lines of railroad would have to be built to the fluvial ports.

The Peruvian Corporation offered to build a railroad from Chililayo, on Lake Titicaca, to these cities, but the Bolivian government, with what would seem at first sight to be lack of wisdom, declined to grant a concession unless the line should be made continuous to Puno.

The benefits of all-rail connection, *via* Puno to the coast are evident, but it is a question whether more may not be lost than gained by this delay, and by the creation of a water route which cannot be a permanent solution of the problem and which, while it may regulate charges to a certain extent, will only disturb the natural course of commerce in this plateau. Mr. Wm. H. Christy, of New York, holds a concession for a line from Puno to the cities named above, which will be built when satisfactory arrangements shall be arrived at with the Peruvian Corporation which controls the existing line between Puno and the coast.

VIAJERO PERUANO.

The Forward Impulse of a Locomotive and the Position of the Wrist Pin.

TO THE EDITOR OF THE RAILROAD GAZETTE:

I have frequently been asked the old question, Is the forward impulse to a locomotive greater when the wrist pin is above or below the centre of the driving wheel? In other words, is the propelling effect of the steam greater at the forward or backward stroke of the piston? I say it is the same in both cases, in which I am told that many would not agree with me. On giving my demonstration I am also asked, Why do you not publish it? It is as follows:

Assuming, as is usually the case, that the centre line of the axle is in the plane of the axes of the cylinders. Let c be the centre of the wheel, w the wrist pin and T the tread face in contact with the rail. Figs. 1 and 2 show the two cases where the wrist pin is at its lowest and highest points. For convenience let the distance $c\,w$ be 1 and $c\ T$ be 3 ft., as would usually be the case with a 6-ft. driver; let the pressure on the piston equal P. In fig. 1 the push P at w would exert pressures at c and T proportionate to the distances of w from c and T; the push at c would be $\frac{3}{4}\,P$ and at T $\frac{1}{4}\,P$. The pressure on the piston and cylinder head being equal, the forward push on the cylinder head and thence to the frame would be P, which is met by the push at c (the centre of the wheel), equal to $\frac{3}{4}\,P$, which tends to pull the frame apart between the jaw and cylinder, and the excess, equaling $\frac{1}{4}\,P$, is a forward pressure at the cylinder head and carries the engine forward, and as we see is equal to the backward pressure at T, the point of contact with the rail.

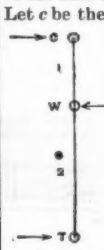


Fig. 1.

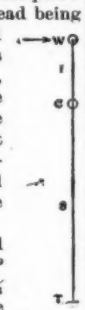


Fig. 2.

In fig. 2 the pressure P at w is forward, and if we consider T as the fulcrum we have P (at w) : c^1 (pres. at c) = 3 : 4, or $c^1 = \frac{4}{3}\,P = 1\frac{1}{3}\,P$, and the pressure at T equal the difference $1\frac{1}{3}\,P - P = \frac{1}{3}\,P$: or if we consider c as the fulcrum we have P (at w) : T^1 (pres. at T) = 3 : 1, or $T^1 = \frac{1}{3}\,P$, and the pressure at $c = c^1$ is the sum of $P + T^1 = 1\frac{1}{3}\,P$. Now what is the effect? There is a backward pressure on the cylinder head equal to P, met by a forward pressure at c equal to $1\frac{1}{3}\,P$, the frame is compressed to the amount of P, and the remaining $\frac{1}{3}\,P$ carries the engine forward as before, and is again equal to the backward pressure at the rail. Can any one dispute it?

As said, the numerical distances were assumed for convenience, but a general statement would be also correct. For instance, let $c\,w = S$ and $c\,T = R$, then in fig. 1

$$c^1 \text{ (pres.}^1 \text{ at } c) = \frac{R-S}{R} \times P \text{ and } P - c^1 = P - \frac{(R-S)\,P}{R}$$

$$= \frac{R\,P - P\,R + P\,S}{R} = \frac{P\,S}{R},$$

and in fig. 2, $P : c^1 = R : R + S$

$$c^1\,R = P\,(R+S)\ c^1 = \frac{P\,(R+S)}{R}$$

$$\frac{P\,(R+S)}{R} - P = \frac{P\,R + P\,S - P\,R}{R} = \frac{P\,S}{R} \text{ as above;}$$

let $S = 1$ and $R = 3$ as above and we have $\frac{P\ S}{R} = P\frac{1}{3}$, also as above.

CHAS. J. BATES.

Some Pointers on the City & South London Subway.

BY FRANK B. LEA, ASSOC. INST. EL. E.

In the absence of detailed information upon many small points or even subsidiary principles connected with the above ingenious and novel undertaking, considerable discussion has taken place, not only in the States, but also amongst home engineers, with regard to this feature or that peculiarity of the line, and every man has had his authoritative say about the matter. These various "says" have of course differed with the individual, and until the author of the line (so far as its civil engineering goes), is able to give *his* version of the facts, probably these discussions will be held with continued vigor. However, Mr. Greathead is put down to read a paper very shortly before the London Institute of Civil Engineers, and then the most positive ones will either have to climb down as to various features of the line, or else they will come out with that most objectionable and aggravating dictum, "I told you so." With regard to one or two points, however, there's no harm in anticipating the details that Mr. Greathead will doubtless enter upon; and with this purpose in view, the writer has obtained from the engineer's courteous and able assistant some reliable information on several features of the line, together with permission to publish the same to the extensive audience of the *Railroad Gazette*.

In the first place, the frequenters of this line have every one of them (that is, the outside public) been puzzled by the labyrinthine way in which the platforms are arranged at the various intermediate stations. There is only one station, indeed, where the up and down platforms are side by side, excluding, of course, the termini, at which the two lines are joined. Probably the same feeling may have been noticed by the Americans who have visited London since the line was opened. It will go without saying that they all make a point of riding on the new line, just as they go to see Stratford on Avon, the Alhambra, and other beautiful country places. This confusion of levels in the platforms at intermediate stations is largely due to the fact that the stations have been built wherever possible at the summits of gradients, so that in running into the stations the trains are considerably braked by the up gradient, and similarly are materially helped in starting by the down gradient. The latter is on the average as much as 1 in 30, while in running up to the station the trains travel on a gradient of 1 in 100. It is not, therefore, to be wondered at that passengers should feel somewhat perplexed, in leaving either platform at a by-station, at passing under or over the other line, as the case may be. The effect any way is rather startling to pass outward to the lift along a vaulted corridor on the same level as the platform just left, and hear a dull rumble immediately overhead as a train from the opposite direction enters the station and draws up.

While speaking of gradients it may be worth while again recording the maxima both up and down. The heaviest gradient so far worked on this line with the load is 1 in 14, and the steepest against the load 1 in 29. These occur not far from the city terminus, and were rendered necessary by the depth to which the line was taken so as to clear the bed of the River Thames, which runs close by. Both these steep gradients are on very sharp curves for such a line as this, the radius of each not being more than two chains; but so far there has been no material difficulty in operating pretty heavy loads on them. At the single by-station where the up and down platforms are on the same level, other reasons than those given decided such a course: thus, for instance, there is here a connection between the two lines for shunting purposes.

The second point to which attention may be drawn is one that to some extent interests the electrician rather than the civil engineer; and yet the latter proves in the end to have most to say about the question. It shows how closely and intimately these matters are connected, and how difficult it is to define clearly the provinces of electrical engineers and civil engineers respectively. The former—when beginning to plan out the method of working the line—would, of course, instinctively say that the trains are to be worked by separate motors on the carriage trucks, so making every wheel a driver, and preventing the many well known disadvantages of using a heavy locomotive at one end of the train. The electrical engineer therefore ascertains the maximum amount of power required for any one train at any part of the line, and thus arrives at the minimum size of his electric motor or motors. From this follow the dimensions of the carriages themselves, and then the man who does the civil engineering part of the line steps in and says, "That won't do; if you want your rolling stock to be of such a size you must have the tunnels increased, ditto your capital!" So the electrician has to knuckle under to his civil comrade and use a locomotive after all, however much he would prefer to mount the motors upon the carriage bogie trucks.

These same reasons will also compel the use of locomotives upon the new line through the centre of London, for which Parliamentary powers have recently been obtained; and these same reasons will also *not* compel the use of locomotives upon the Liverpool overhead railway, now being erected under the supervision and according to the designs of Mr. Greathead. In the latter case the lines are in the open air, there is plenty of side as well as top room, and accordingly electric power will be employed to work the line in the form of motors mounted upon the car trucks in a way to please the most precise of electrical engineers.

The tunnels for the Central London Railway will be 1 ft. 6 in. larger in diameter than those on the South London line,* but even this increase in size is not sufficient to allow of motor trucks being used. It is found, however, in practice that no difficulty follows on the use of locomotives, the mere weight of the electric motor secures ample adhesion for driving purposes, besides which each train consists of only three close coupled cars, forming what is really one long carriage or vestibule car with flexible connections or joints in two places.

Ten-Wheel Compound Locomotive—Southern Pacific Company.

[WITH AN INSET.]

The Schenectady Locomotive Works have recently built a heavy ten-wheel compound freight locomotive for the Southern Pacific. This engine is shown in the illustrations herewith, and following are the general dimensions:

Gauge of road	4 ft. 8½ in.
Fuel	Bituminous coal.
Total weight of locomotive in working order	126,000 lbs.
Total weight on drivers	99,500 lbs.
Total wheel base	22 ft. 5 in.

* The tunnels of the City & South London are 10 ft. in diameter from the City to the Elephant and Castle station, and 10 ft 6 in. for the rest of the line.—EDITOR.

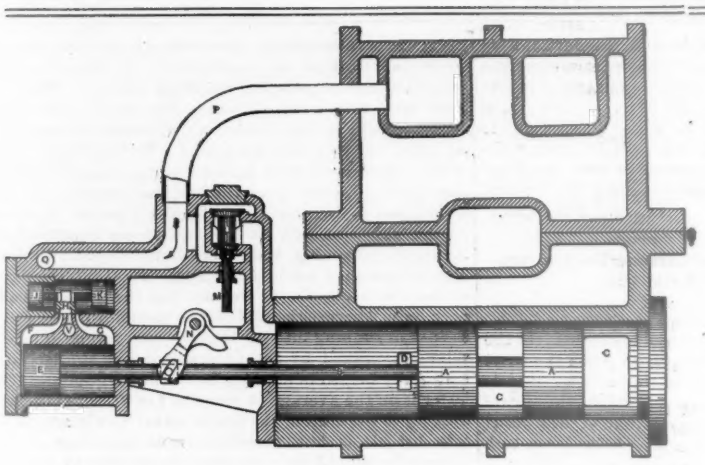


Fig. 1.

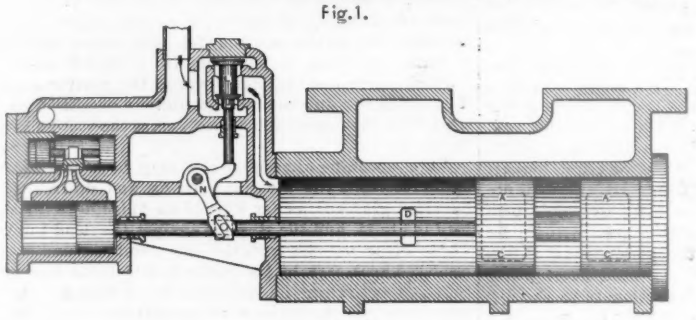


Fig. 2.

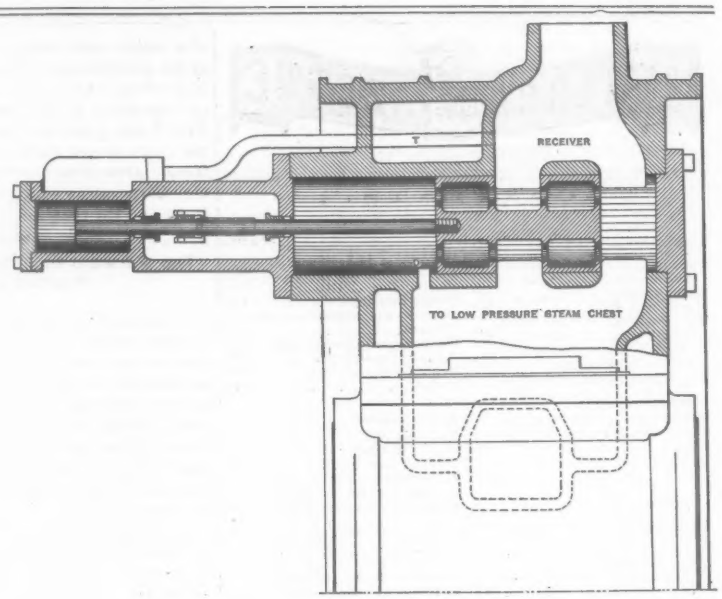


Fig. 3.

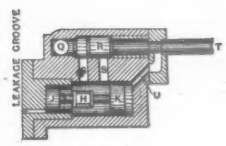


Fig. 4.

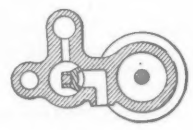


Fig. 6.

Driving wheel base	12 ft.
Rigid wheel base	6 ft. 6 in.
Diameter of high pressure cylinder	20 in.
Diameter of low pressure cylinder	28 in.
Stroke of cylinders	26 in.
Piston of high and low pressure cylinders of cast steel, rings sprung in.	
Kind of piston rod packing	Sullivan metallic
Diameter of piston rods	3½ in.
Size of steam ports in high pressure cylinder	18 in. × 1½ in.
Size of steam ports in low pressure cylinder	20 in. × 1¾ in.
Size of exhaust ports in high pressure cylinder	18 in. × 3½ in.
Size of exhaust ports in low pressure cylinder	20 in. × 3½ in.
Width of bridge in high and low pressure cylinders	1½ in.
Greatest travel of slide valves	both 5½ in.
Outside lap of slide valves	both ¾ in.
Inside clearance of high pressure valve	5/16 in.
Inside clearance of low pressure valve	1/8 in.
Lead of high pressure slide valve in full stroke	3/32 in.
Lead of low pressure slide valve in full stroke	1/8 in.
Kind of slide valves	Richardson balanced.
Kind of valve stem packing	Sullivan metallic.
Diameter of driving wheels outside of tire	55 in.
Diameter and length of driving axle journals	7½ in. × 8½ in.
Style of driving box, cast iron with heavy circular brass bearings.	
Diameter of truck wheels	28 in.
Diameter and length of truck axle journals	5 in. × 9 in.
Diameter and length of main crank pin journals	5½ in. × 5½ in.
Diameter and length of intermediate crank pin journals	5¾ in. × 5 in.
Diameter and length of front and back crank pin journals	4½ in. × 3½ in.
Length of driving springs from centre to centre of hangers	Main, 34 in. Front, 34 in.
Working pressure	180 lbs.
Style of boiler	Wagon top.
Diameter of first ring outside	60 in.
Material and thickness of plates in waist and outside of firebox	Steel, 5/16 in. thick.
Horizontal seams	Quadruple riveted, with welt strip inside.
Circumferential seams	Double riveted.
Size of firebox inside	Length, 96 5/8 in.; width, 42⅝ in. Depth, 60¼ in. front, 57¼ in. back.
Material and thickness of plates in inside of firebox, steel, crown, ⅜ in.; tube, ½ in.; sides, 5/16 in.; back, 5/16 in.	
Water space around firebox	Front, 4 in.; sides and back, 3 in.
Material of tubes	Syracuse iron.
Diameter of tubes	2¼ in.
Number of tubes	235
Length of tubes over tube sheets	13 ft.
Crown stayed by crown bars.	
Size of crown bars	.5 in. × ¾ in., welded at ends.
Heating surface in tubes	1,788.3 sq. ft.
Heating surface in firebox	141.2 "
Total heating surface	1,929.5 "
Grate surface	28.6 "
Style of grate	Rocking, with drop plate.
Style of ash-pan	Hopper, with slides in bottom.
Exhaust nozzle	Single.
Diameter of exhaust nozzle	5¼ in.
Throttle	Balanced valve in dome.
Inside diameter of stack	16 in.
Smokestack top above rail	15 ft.
Boiler supplied by two injectors, placed right and left.	
Weight of tender, empty	31,800 lbs.
Number of wheels	Eight.
Diameter of wheels	33 in.
Diameter and length of journals	4¼ in. × 8 in.
Total wheel base of tender	15 ft. 3½ in.
Distance from centre to centre of truck wheels	4 ft. 4 in.
Style of tender frame	S. L. W. standard, 6⅛ in. × 4 in. × ¾ in., angle iron.
Style of trucks	S. L. W. standard, 4-wheeled channel iron bolster, centre bearing front and back, with additional side bearings on back truck.
Water capacity	4,000 gallons.
Fuel capacity	8 tons.
Total wheel base of engine and tender	48 ft. 5/16 in.
Total length of engine and tender over all	57 ft. 7 in.

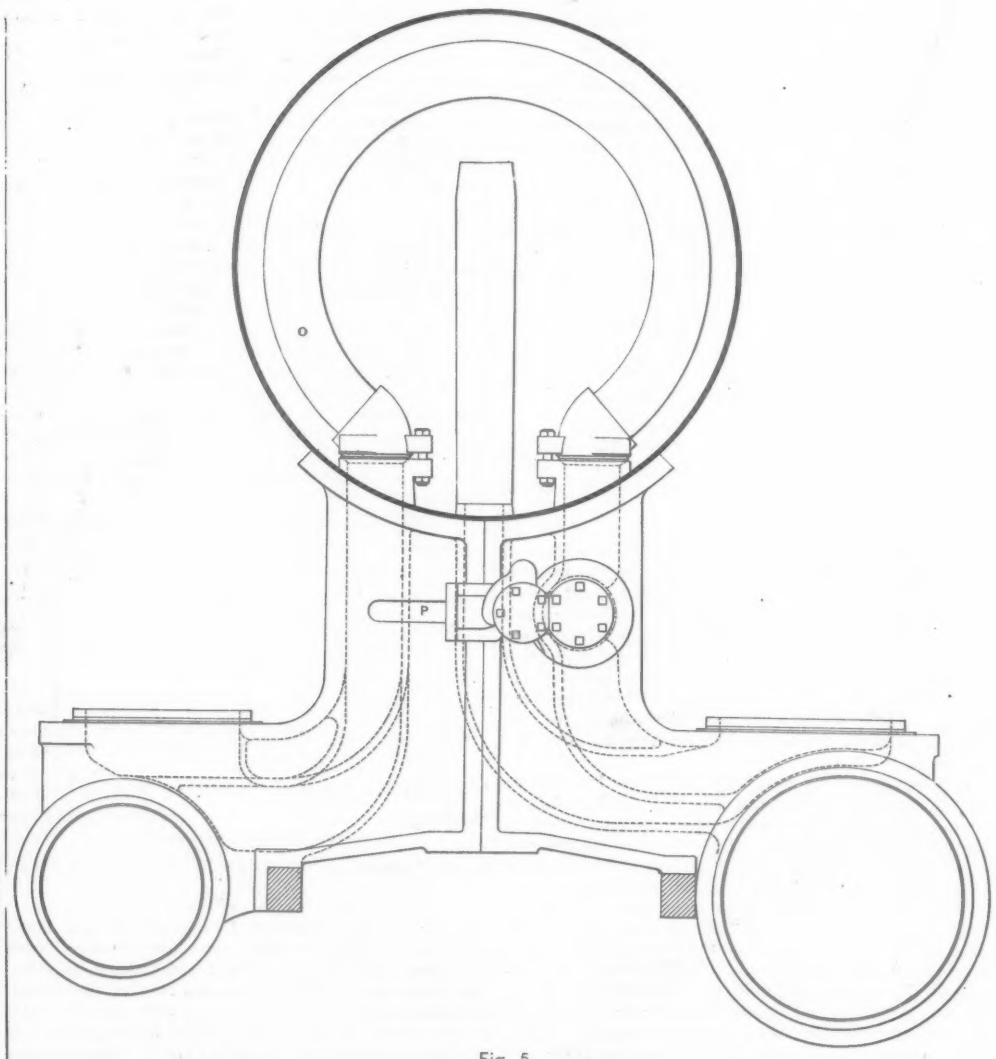


Fig. 5.

IMPROVEMENTS IN COMPOUND LOCOMOTIVES.

By A. J. PITKIN, *Superintendent Schenectady Locomotive Works.*

Probably the most interesting feature of this engine is the new starting gear and intercepting valve apparatus, invented by Mr. A. J. Pitkin, Superintendent of the Schenectady Locomotive Works. This we show in considerable detail. Figs. 1 and 3 show the intercepting valve open; that is, in the position before the engine starts. Fig. 2 shows the intercepting valve closed or in the position at the time of the initial movement. The construction of this valve is as follows: (See figs. 1, 2 and 3).

There are two pistons *A A* at one end of the single stem *B*, which moves to and fro in a cylindrical chamber having three openings. Two of these openings, *C C*, lead to the receiver and to the low pressure steam chest, as shown in fig. 3, and it is the office of the pistons *A A* to open and close these large openings and prevent the steam in the low pressure steam chest from entering the receiver when it is not wanted there. The other opening, *D*, in this cylinder (see figs. 1 and 3) connects the intercepting valve cylinder with the low pressure steam chest.

So far, we have described the intercepting valve proper. The remaining portion of the mechanism is the apparatus for driving and connecting the intercepting valve. It is constructed as follows:

On the end of the stem *B*, which passes through a stuffing box in the end of the intercepting valve chamber, there is a piston *E* which moves in a small cylinder having ports *F* and *G*, one at each end. These ports lead to a valve seat on which is a plain *D* valve not unlike the ordinary locomotive slide valve. This slide valve is

moved to and fro by means of a double piston with a stem between, shown at *J* and *K*. These pistons are of different diameter, *K* being larger than *J*; and as they move to and fro they carry with them the slide valve. The office of this portion of the mechanism is to move the intercepting valve *A A* to and fro, as desired.

The third part of the device consists of a balance poppet valve *L*, which is placed in the path of steam coming direct from the boiler to the low pressure cylinder to assist in starting. This valve has an extended spindle, *M*, on the lower side, and is lifted by means of a bell crank, *N*, which is driven by means of a trunnion on the intercepting valve stem *B*. As the stem *B* passes to the right, the valve *L* is lifted, and as it passes to the left the valve *L* is allowed to fall. Fig. 4 is a detail of the pipe connections and passages leading to the pistons *J K*, the office of which will be described in what follows. Fig. 5 shows the location of the intercepting valve and its parts in relation to the cylinders and steam pipes. Fig. 6 is a section through the slide valve *H* showing that it has a cylindrical seat. The operation of this valve is as follows:

The engineer opens the throttle, as usual. Steam passes into the high pressure steam pipe *O*, fig. 5, and passes through the pipe *P*, which is tapped into the side of the saddle to the apparatus which actuates the intercepting valve, as shown in figs. 1 and 5. It passes down through the passage *Q* through the small ports *S S* between the pistons *J* and *K*. *K* being larger than *J*, it has a greater total pressure; hence, the pistons move to the right and carry the slide valve with them. This opens the port *F* and allows the steam to pass on the left side of the piston *E*, and forces it, together with the intercepting valve *A A*, to the right until it is in the position shown in fig. 2 with the *C C* passages closed. The position of the pistons *J K* and the slide valve *H* at this time are shown in fig. 2.

During the foregoing operation, as the intercepting valve stem *B* moves to the right it carries with it the bell crank *N* to the position shown in fig. 2, thus lifting the balance poppet valve *L* and admitting steam, as shown by the arrows, fig. 2, into the intercepting valve cylinder, from whence it passes out through the opening *D* into the low pressure cylinder steam chest, and in this way steam is admitted direct from the boiler to the low pressure steam chest always just before the engine starts.

As soon as the engine has started and there is an exhaust into the receiver from the high pressure cylinder, steam passes from the receiver through the pipe *T*, shown in fig. 3, to the passages leading to the small slide valve *H*, as shown in fig. 4. This pressure acting on the right hand side of the larger piston *K*, through the smaller passage *U*, overcomes the pressure on the other side of this piston *K*, and the pistons *J* and *K* move to the left, carrying the slide valve *H* with them. This movement opens the steam passage *G*, fig. 1, and the exhaust passage *V*, and admits steam to the right hand side of the piston *E* and drives it to the left and with it the intercepting valves *A*, thus opening the passages *C* and the receiver to the low pressure steam chest. At the same time the bell crank *N* is moved to the left and the valve *L* is allowed to drop into the position shown in fig. 1, thus cutting off the connection between the boiler and the low pressure steam chest. After this the engine works in the well known way of the two-cylinder compound—that is, by taking steam into the high pressure cylinder, discharging it into the receiver, taking it out of the receiver into the low pressure cylinder and discharging it into the atmosphere.

This intercepting valve apparatus differs considerably from the one first designed by Mr. Pitkin, and used on the Michigan Central Railroad. A description of that was given in the *Railroad Gazette*, Jan. 31, 1890, page 73. That valve was operated by a piston, as the present one is, but it was only closed by the steam from the boiler, and the opening was performed by the pressure in the receiver acting on the intercepting valve itself. There was also an oil dash pot in the first design which prevented the intercepting valve from hammering. The same result, namely, the prevention of steam entering the receiver from the low pressure steam chest at starting, is produced in both the first and this, the second, design of the Pitkin intercepting valve. The difference between these valves lies in the mechanical construction and the method of moving the intercepting valve.

Suburban Locomotive for the New York Central Railroad.

[WITH AN INSET.]

The New York Central Railroad has introduced a new locomotive for suburban service to run between the Grand Central station and Yonkers on the local trains. The design is shown by the accompanying cut made directly from a photograph. (See the inset.) There are some novel features about these locomotives that are worthy of note.

The rear truck is made with six wheels with "porpoise" springs above and between the boxes, which act as equalizers. There is a front truck constructed with a radius bar and equalized with the drivers. The tank extends forward under the cab. This is done to reduce the overhang of the tank at the back end. The fireman stands in a pit between the legs of the tank, while the engineman is on top of the running board which is on a level with the top of the front leg of the tank. The position of the engineman is good, as he stands high enough to see both ways, over the front of the engine and the back of the tank. This is a point neglected in some recent designs of suburban engines. For that class of work it is absolutely necessary for safety that the engineman shall be able to see the track ahead within a few feet of the end of the pilot. On this engine another point of advantage is gained over some other designs by giving the engineman a chance to see the rods and crossheads while in motion.

The parallel rods are of I section with solid ends. The main rod is rectangular with straps on the back end and keys at both ends. The crossheads, and guides are of the Laird type. The engine is equipped with the Westinghouse driver and truck brake with complete attachment for the train. There are two ventilators in the cab roof.

The drivers carry 90,000 lbs. The cylinders are 18 in. in diameter by 22 in. stroke. The steam pressure is 180 lbs. per sq. in. The fire box is placed above the frame and is made large enough to use anthracite coal. The appearance of the engine is very good indeed. The design is by Mr. William Buchanan, Superintendent of Motive Power, and the engines were built by the Schenectady Locomotive Works. Following are the general dimensions:

Fuel, anthracite coal.	
Boiler:	
Barrel, diameter	56 in.
Thickness, steel	½ "
Tubes, 254, diameter	2 "
" length	11 ft.
Firebox, length	108⅜ in.
" width	61¾ "
" depth	61¾ and 54¾ "
Crown bars (welded in pairs)	5 × ¾ "
Grate area	31.9 sq. ft.
Heating surface:	
Firebox	144.9 sq. ft.
Tubes	1451.8 "
Total	1596.7 sq. ft.
Smoke stack, diam. inside	15 in.
Exhaust nozzles, double	3⅝ "
Water capacity, tank	2,300 galls.
Coal " tender	2¾ tons.
Cylinders	18 in. diam., 22 in. stroke.
Steam ports	16 in. × 1¾ in.
Exhaust ports	16 in. × 2½ in.
Richardson balanced valves, lap ¾ in. outside, ⅛ in. inside.	
Greatest travel of valve, 5½ in.; lead, full stroke, 1/16 in.	
Driving wheels, diameter	64 in.
" journals	7½ in. × 9 in.
Front truck, wheels	30 "
" " journals	5½ in. × 9 "
Rear " wheels	30 "
" " journals	4½ in. × 8 "
Main crank pins	4½ in. × 4½ "
Intermediate crank pins	5 in. × 5 "
Front and back " "	4½ in. × 3½ "
Total wheel base	35 ft. 7 "
Rigid wheel base	12 " 9 "
Total weight, with water but no coal	163,500 lbs.
Distribution of weight: Front truck, 16,000 lbs; drivers, 95,000 lbs.; rear truck, 52,500 lbs.	

A Brooks Suburban Locomotive.

The Brooks Locomotive Works have built for the Chicago & Northern Pacific a new design of suburban engine having four drivers and a two-wheel truck at the front and at the rear. The engine is considerably like an eight-wheeler with the truck under the back end, with side tanks and a rear coal bunker. The back truck is equalized with the drivers. The engine has the modern smooth finish and a taper stack, and has a wooden pilot in the front and rear. Sand boxes are placed before and behind the drivers. The engine is designed to burn anthracite coal or coke. It has an extended smoke box and fixed Miller buffers front and back. There is a special form of binder for the pedestals of the frame jaws consisting of strap bolts which pass outside of the pedestals instead of through them. The engine presents a handsome appearance, and the details are well designed. It has the following equipment: Crosby pop valves, United States metallic packing, Cook bell ringer, Latrobe tires, monitor injectors, Westinghouse air brake for train and signal, and New York Air Brake Co.'s driver brakes.

The following are the general dimensions:

Cylinders	15 × 22 in.
Driving Wheels	57 in.
Rigid driving wheel base	7 ft.
Total wheel base of engine	27 ft. 10 in.
Weight on drivers, working order	56,000 lbs.
Weight on front truck	23,200 lbs.
Weight on rear truck	21,000 lbs.
Total weight of engine in working order	100,200 lbs.
Tank capacity (two side tanks)	1,600 gal
Fuel, bunk capacity	2½ tons coke
Boiler:	
Style of boiler	Wagon top.
Material	Spang steel.
Diameter of shell	46 in.
Thickness of shell	⅜ in.
Tubes	Lap welded, charcoal iron.
Number of tubes	140
Diameter of tubes	2 in.
Length of tubes	9 ft.
Firebox, steel	84 × 34 in.

Thickness of sides, 5/16 in.; crown, ⅜ in.; back, ⅜ in; tube sheet, ½ in.

Water spaces, 4 in. front; 3 in. side; 3 in. back.

Crown support, double bars, ¾ × 4½ in.; centres, 5¼ in.

Steam pressure, 180 lbs.

Machinery.—Piston rods, hammered steel. Guides, case hardened. Crosshead, cast steel. Steam chest valve, Morse balanced. Driving axles, iron, 7 × 8 in. Connecting rods, iron. Crank pins, iron.

Engine trucks (leading and trailing)—Style, swing centre. Wheels, cast iron; spoke, 30 in. Axles, iron. Journals 4½ in. × 9 in.

The Western Society of Engineers has an Outing.

The Western Society of Engineers held its first Fall meeting on Wednesday, Sept. 2, out of doors. A special train was provided by President Fish, of the Illinois Central. Starting at 10 o'clock the party visited

THE WORLD'S FAIR GROUNDS.

The train was backed across the lagoon over to the lake shore, giving an excellent opportunity to see the foundations of the administration, mines, and woman's buildings, as well as the excavations and sites for the other structures. The point of special interest was the modeling plant. The work of this department may be said to have but fairly begun, as the extent of this class of labor can only be realized when one considers that the decorations and statuary for all the buildings must be manufactured in so short a time. The "reliefs" are laid out on board frames with charcoal sketching and then worked up to the proper thicknesses. The material used for this class of ornamentation is the clay taken out of the lagoons and canals by the dredges in the grounds. Portions of friezes and cornice work, as well as pillar coverings, were seen in various stages.

The principal ground work material for the exterior finish on most of the buildings is what is termed "staff." This is a composition of plaster, cement and a wood fibre or oakum. This latter gives a firm consistency to the "staff" and prevents looseness or cracking in the covering when on the walls.

PULLMAN.

After lunch the party went to Pullman and through the shops. There they saw some new parlor and chair cars under construction for the Pennsylvania and the Northwestern. These represent the latest designs in stamped and grill work, and are furnished with easy seats and chairs of rich finish, much attention having been paid to the perfection of details. In the street car department the double deck tram cars were shown, by which the height, heretofore necessary with this class of carriages, has been reduced, and the passengers on the top now sit on an intermediate deck with their backs against the monitor deck and their feet resting on a platform deck cut out of the angle in the upper corner of the ordinary car. These cars are now being turned out by the Pullman Company, with the staircases at the ends in some cases, and in others at the centre of the car, the two ends being closed. The upper decks are supplied with awnings and may be closed in with glass around the sides during the winter. From top of the rail to the top of the upper foot board is but 7 ft. on a single truck car, and as they are enabled to double the capacity of the car in this way with an additional expense of but 15 to 20 per cent., the advantages will be apparent. The party was much interested in the woodworking departments where there is a highly successful system of conveying all dust and shavings from the boring and planing machines.

BRIDGES.

From Pullman the train went over the West Indiana to the Chicago, Madison & Northern tracks, thence to the crossing of the C., B. & Q. Here the C. M. & N. has erected a 161-ft. span bridge having a shallow floor system, the distance from the bottom clearance line to the base of rail being 2 ft. The floor is made up of boxes formed of angles and plates with the ties placed in these boxes on short angles riveted to the vertical plates. These boxes are supported on angles riveted to the longitudinal girders. All the ties are sized exactly, and in erecting the bridge it was found that when completed a straight edge placed over the top of the ties showed the surface to be level within about 1/16 of an inch. This floor weighs about 350 lbs. more per lineal foot than the ordinary floor system. The cost for erection of this bridge, including painting, was seven-tenths of a cent per pound, and total cost a little less than 4½ cents. The viaduct over Ogden avenue is built with the same system of floor and measures 146 ft. in length.

The next point visited was the "skew" bridge over the canal. It is a five panel skew, 254 ft. length of truss, and 90 ft. (at right angles) between abutments. The bridge has four tracks, each span having one fixed and three sliding ends.

The visit planned to the works of the Illinois Steel Co. was unavoidably postponed on account of lack of time, although some went through the plant and took the street cars back to the hotels.

The interlocking system of switches at the balanced draw span where the C. M. & N. and Chicago & Alton tracks cross the south branch of the river elicited much interest. The latter tracks come in here from the south, running over the others by the use of frogs and crossings at either end, so that there are eight rails across the bridge laid in pairs spaced 4½ ins., although the width of the draw is sufficient only for a double track.

This draw bridge swings with one end over the river while the other and shorter end is over the land. The land end trusses are of eye bars, whereas those over the river are the usual latticed posts and chords with eye bar diagonals. The extra weight of the long end is counterbalanced by material placed in a plate girder box below the floor, thus making the bridge swing without the slightest uneveness.

The intricate system of crossings at Stewart avenue, which are to be changed and interlocked as shown in the *Railroad Gazette* of April 24, 1891, was next looked over. This work is just about to be vigorously taken in hand as all the difficulties concerning trackage and rights between the various roads crossing here have at length been amicably settled.

The tie preserving plant of Mr. Chanute was unavoidably omitted, although opportunity was given the following day for individual members to see it.

There were altogether about 125 in the party making

the round trip, and to the efforts of Messrs. Cooley, Wallace and Weston the success of the trip is largely due.

ENGINEERING BUILDING.

At the evening session at the Grand Pacific the principal subject before the members was the project for erecting an engineering building to be placed on some desirable corner in the centre of the business portion of the city. The committee appointed for the purpose has developed the project on a conservative basis, and the interest manifested by the members seems to warrant the expectation that before long the erection will be fairly under way. The comparatively small amount of stock yet to be sold, it is believed, will not delay the enterprise.

The proposed building is to be 12 stories high with an additional high story, occupying the central portion of the building, designed for the quarters of the society. The site proposed is 189 ft. × 72½ ft. on a corner.

The object of the company is to form and assist in maintaining an organization for the advancement of the science of engineering and the interests of the engineering profession, for maintaining a library and assembly rooms, and for the publication of scientific and engineering literature. The capital stock of the company will be $400,000. The company will issue $300,000 in first mortgage bonds at 6 per cent. or less. The building to be erected, with all incidental expenses, will not exceed in cost $600,000, of which $300,000 is provided for in first mortgage bonds, $300,000 by an equal amount of the $400,000 stock to be issued. One hundred thousand in stock forms a surplus to cover any possible emergency which might arise. After paying the running expenses, six per cent. interest on bonds, eight per cent. on the stock issued and paid for, and $20,000 being set aside toward a sinking fund to retire the bonds, any surplus income will be divided equally among the stockholders and the Western Society of Engineers. This Society will have the privilege of purchasing the stock issued at the expiration of 10 years at its then market value. The rental of the floors above the ground floor and first story are assumed at a uniform price of $1.75 per year per square foot. Of the $300,000 in stock which it is now proposed to place, $150,000 is already provided for, leaving $150,000 to be taken among members of the society and their friends. The shares are to be $100 each, payable in four installments, between Nov. 1, 1891, and May 1, 1892.

Shallow Bridge Floors.

One of the topics considered by the Western Society of Engineers at its last meeting was that of shallow bridge floors. The call for careful examination into this construction has become urgent on account of the requirement of the Railroad and Warehouse Commissioners of Illinois for overhead crossings wherever feasible. It is especially urgent where railroads pass through cities on elevated track and must reduce as much as possible the height of the rail above the street. Where long embankments occur at both ends of bridges the increase of clear height by even a few inches adds materially to the cost of filling, so that an expenditure of time in devising some means of lowering the floors is a good investment.

A difficulty of this kind was presented to the Chicago, Burlington & Quincy some months since at a point where it became necessary to raise their tracks for quite a distance to allow another line to pass under, and as this place was near a townsite it was imperative to keep the distance from the clearance line to the top of the rail very small. The illustrations given show two schemes presented by the engineering department for meeting this end.

In fig. 1 the length of the span is made for convenience 39 ft., but it was expected that when the matter was worked up in detail this distance might be changed to 32 or 42 ft., as circumstances required. The plate girder was determined upon as being 42 in. in depth, built up to suit the length of span, the height being limited by the standard car clearance line used by this company. The height of the rail is taken at 5 in. and that of the cross girders 12 in. These transverse (I-beam) girders are set with their bottom line on a level with that of the bottom plate on the main girders.

The ties are cut out around the top to fit around the upper flange of the I-beams and sufficiently to allow a small space between the beams and rails. The ties are bolted to the beams in pairs with rods threaded at both ends. This permits the removal of the ties by slipping all bolts (in any one pair of ties) to the left as far as possible, then moving the right hand tie out to the right and then down. The bolts are then slipped clear over to the right, when the left hand tie may be removed in a

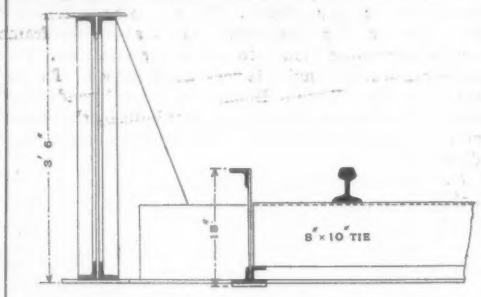


Fig. 2.

similar manner. In putting in ties this order is reversed. The I-beams are riveted in the usual manner to gussets fastened with angles to the web of the main girders.

The second method, fig. 2, contemplates introducing intermediate longitudinal girders. The web plates for these extend only between each pair of transverse girders, and are connected above the latter by short web plates. The angle iron at the top and the plates along the bottom, however, reach the full length of the bridge span. By placing these intermediates at proper distances from the rails, and having but one angle iron at the top, they also serve as guard rails. The ties are fastened down to angles riveted to the inside of these plates. The top of the rail is on the same line with the top of the intermediate girder, from which point to the bottom of the plate is 18 in.

It was suggested that the transverse girders be made up of two channels, back to back, with a plate between, and that the plates extend up to the gusset, so the channels might be riveted each side. Either one of these floor schemes would reduce this height above the clearance line to quite a small amount, though the second construction would be somewhat more expensive than the first, and the manner of removing the ties when bolted direct to the transverse members would be more convenient and therefore cheaper for renewals of track.

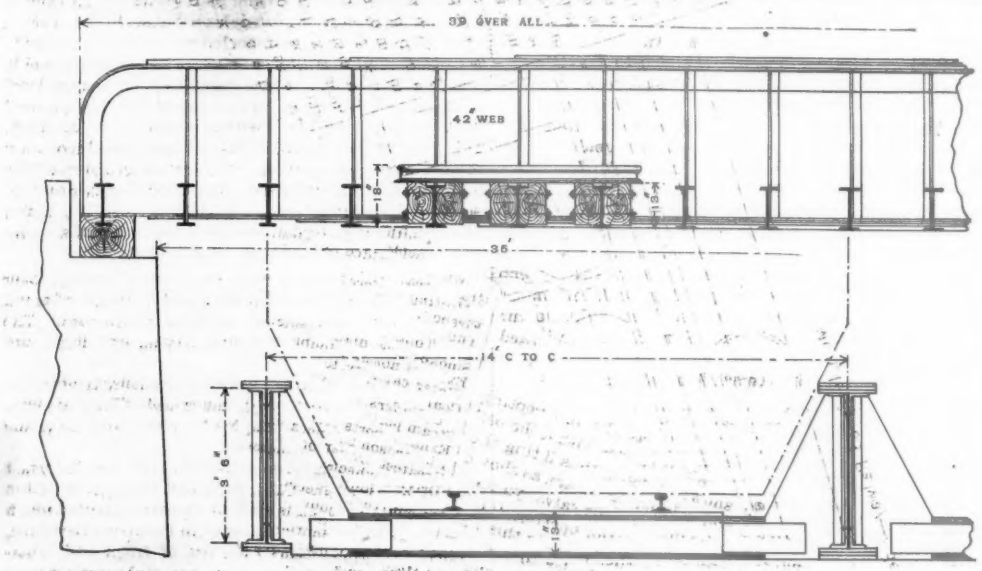


Fig. 1—Shallow Bridge Floors.

Continuous Rails.

What follows is the substance of a paper by Mr. R. Taylor Gleaves, read before the Engineers' Club of Philadelphia, Nov. 15, 1890, and just published in the *Transactions* of that club. So far as known this is the only experiment yet made with Mr. Noonan's scheme. Certainly the results are astonishing.

In 1886, Philip Noonan, a section master on a Louisiana railway, took out a patent on "A self-surfacing track," the chief feature of which is a continuous rail. In June, 1889, I laid three miles of track, under that system, on the Lynchburg & Durham Railroad, and now, after a test of 11 months, I venture this account of it.

The ground covered by the patent may be briefly stated as follows: Continuous rails of the ordinary T pattern, carried upon ordinary ties of wood or iron, weighted down with a covering of earth, gravel or stone, so that they cannot easily move.

The spikes are not driven home by three-eighths of an inch, so that undulations may take place in the rail without disturbing either the spikes or ties. At fixed points in the track, such as frogs, and at the foot of heavy grades, the main line rails are turned out with an ordinary split-switch point, as if a regular turnout was to be put in.

In fig. 1 *A* is the switch point that continues the gauge of main line; *B* is the main line rail turned out; *C* is a cast steel clutch, one end of which grips the base of the rail, the other bears against the 10-ton spiral spring *D*.

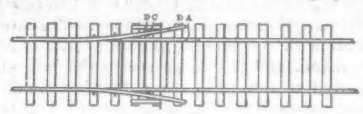


Fig. 1.

The action of the track is as follows: Owing to the spikes being slightly lifted, the rail has a limited vertical motion, and owing to the turnouts at each end of long sections, a free longitudinal motion. Now, when a rolling load comes upon it, minute waves are formed, and the rail creeps in the direction the load is moving. You are all familiar with the annoying results brought about by this in the ordinary track, but under the Noonan system it becomes the *summum bonum* and brings out the striking features of the patent. The action for the track under a moving load resembles that of a linen collar when a laundryman passes a flat iron over it; the undulations formed in front of the iron (or load) are pushed ahead to the end of the collar (or track section), leaving all behind it straight and smooth: and in the case of the rail the clutch *C* allows the waves to pass out, and the spring *D* takes up any backward motion of the rail and prevents noise or jar. Fig. 2 is a section of the track, showing the lifted spikes and the covering of the ties.

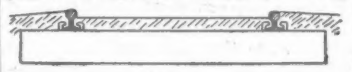


Fig. 2.

In putting down the track the first difficulty encountered was to secure an absolutely continuous rail. The cost of an electric welding plant placed it beyond my reach, and I was, therefore, forced to use two heavy fish bars, ¾ in. thick, bored with round holes, that corresponded to the fishing of the rails when the ends were brought in contact; then with drift pins and four 1-in. rivets I made a joint that has not opened in the slightest, and a rail that is practically continuous. While the riveting was in progress, and before the track had been either surfaced, lined or covered, there was some trouble from expansion; but since it has been completed there has not been the slightest buckling, nor is there any perceptible pulling in on the curves.

The ties are covered with a red clay containing some loam, and to prevent dust I turfed a part of the track and sowed grass seed over the remainder. Now, instead of a wrench, the watchman pushes a mower, and the roadbed looks like a pretty green lawn, with two metal ribbons laid across it.

It is useless to call your attention to the expansion of an ordinary 30-ft. rail under the various ranges of temperature, but I am much puzzled to tell what becomes of the expansion and contraction in a rail three miles long *when it is at rest*. So long as rolling loads are passing over it, and the rail has a longitudinal motion given it every few hours, I can easily account for the disposition of changes in length; but these rails have remained undisturbed for 36 consecutive hours during a variation in temperature of 30 degrees, yet the alignment of the long tangents has not varied, nor have the curves altered their positions.

I am well aware of the prejudice against new appliances, and I, myself, confess to a conservatism that makes me dread the advent of a man with a patent. In the case of this track system I declined positively to test it until directed to do so by the President; but now that the test is made, I am a convert, and, with the zeal common to recruits, must speak out. Quite a number of trackmen and a few engineers have examined the system. The trackmen are all delighted with it: the engineers look wise, shake their heads, and doubt its utility. One prominent manager listened very intently to a description of it and then said: "Why, it's impossible. No track can be maintained without stone ballast and constant labor."

It is natural that I should dislike being doubted, yet my convictions force me to the following assertions: that there is in Virginia a section of track laid with rails three miles long; that it has been in service since June, 1889; that it has not been surfaced or lined since put down; that the only expense of maintaining it has been the watchman; that engines weighing 104,000 lbs. are frequently run over it at a speed of 50 miles per hour; that it is simply ballasted with earth, and that I shall take pleasure in showing it to any one who cares to investigate.

The National Surface Cattle Guard.

The cattle guard known as the National Surface Guard is now familiar in a general way to all railroad men, and we propose here to describe only the changes and improvements that have been made somewhat recently.

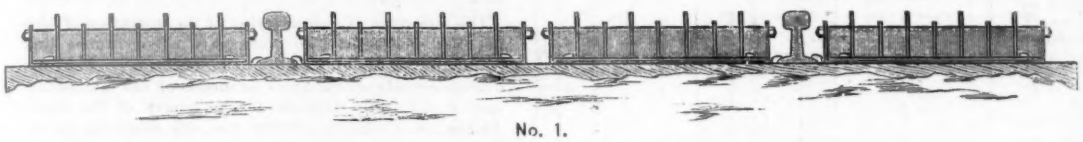
The vertical stiffness has been changed somewhat, so that loose brakebeams or rods will not injure the guard materially, and the lateral stiffness has been reconsidered so as to permit a certain vibration when cattle step on the guard. This is an important factor in stopping cattle, as stock will frequently cross a sharply pointed guard, provided the strips are held down solidly, with no side motion.

Other improvements and modifications will be made clear by examination of the cuts herewith.

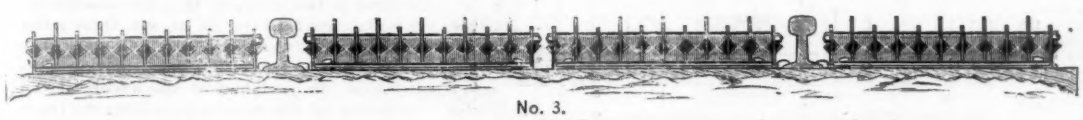
The general construction of Nos. 1, 2 and 3 is similar in the main, the difference being in the form of the longitudinal strips, those in No. 1 being plain slats 9 ft. long, spaced 2½ ins., with the alternate slats 4 in. and 2½ in. in height. No. 2 has saw teeth on the 4 in. slats for one-third their length, and like the first, weighs 140 lbs. for each section, or 560 lbs. for a single track guard. This form was designed for use throughout the states where range cattle are found, the saw teeth being placed toward the highway. No. 3 has in addition to the saw

teeth, barbs on all slats; the spacing is lessened to 2¼ in., and the weight increased to 600 lbs. These barbs will prick the legs of hogs, and this form is designed more especially for the "razor back" hogs found in the Southern states. No 5 is somewhat lighter than the others, weighing only 400 lbs., and is made of angle iron, with 2 in. openings, and 2 in. difference in the height of the slats. On account of the lateral stiffness of the angles no intermediate blocking is found necessary.

The great advantage of these designs is found in the fact that the roadbed retains its normal structure at points where guards are placed. To introduce these guards two crossties are removed and replaced by two sawed ties 10 ft. long and spaced 9 ft., the intermediate ties being laid at the centre and under the distance blocks. The construction of this distance blocking is shown in the smaller cuts, and consists of a sheet stamped out and pressed down in a former into a ∧ shape. In one design the slats are made of ⊥ shapes, in which case the blocking is made in two parts and riveted.



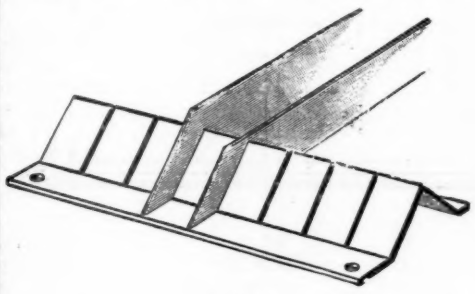
No. 1.



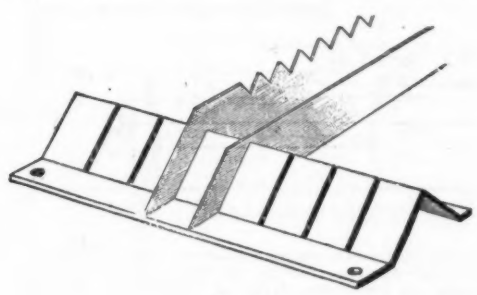
No. 3.

This guard when laid is suspended for the 9 ft. and does not rest on the intermediate ties, being spiked down securely with four track spikes. Each section is closely fastened together with four bolts just under the top of the ∧. All of the above mentioned cattle guards are made of steel throughout.

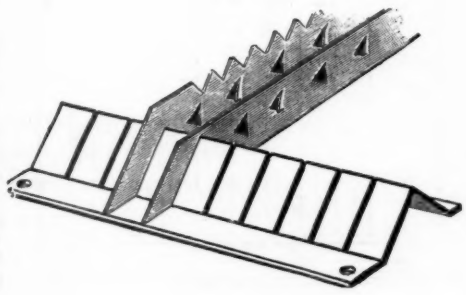
A serious source of wreckage with the pit guard is the dropping of the derailed trucks into the hole in the track and ditching the cars behind. This, of course, is avoided with the surface guard. Putting down these guards requires no skilled labor and is also easily and quickly done; the total cost when in place being much less than that for labor and material on many of the old forms standard on the different lines.



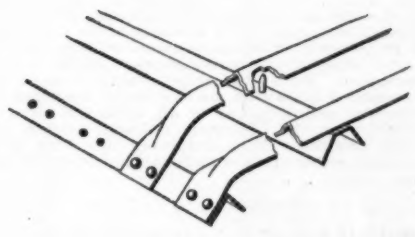
No. 1.



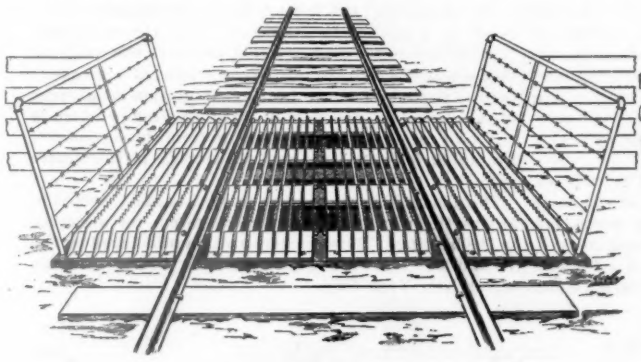
No. 2.



No. 3.



No. 5.



No. 2.

No. 5.

THE NATIONAL SURFACE CATTLE GUARD.

Canadian Railroads as Servants of the United States.

In the *Independent* of Sept. 3 Senator Hoar, of Massachusetts, writes under the above heading. We reproduce a considerable part of his paper, which in the main takes precisely the ground that we have always taken in this matter.

In the rivalry between American communities, the question of cheapness of transportation will have much to do with success or failure. There seems to be no good reason why American merchandise should prefer to a short and cheap route through Canada a longer and more expensive one, merely because the latter is wholly on American soil. As well might seaboard cities refuse to avail themselves of cheap water transportation and send their merchandise wholly by land at greater cost. Canada not only connects the two oceans by shorter parallels of latitude, but her territory projects itself into ours like a vast elbow. The northern extremity of Maine is in latitude 47° 40', while the line separating us from British Columbia, Assiniboia and the westerly half of Manitoba is the line of 49°. So that nearly the whole of the settled portion of Canada, and all her great water system, including a great part of the St. Lawrence River, lies south of some of the most important cities of the United States, and very slightly to the north of many others. . . . Nature seems to have designed Canada for the closest relations to the United States. On the other hand, her provinces can be connected with each other only by very costly artificial bands. The towns on Puget Sound, Tacoma and Seattle, are natural metropolitan centres of trade for British Columbia. The natural centres of trade and manufacture for Manitoba are St. Paul and Minneapolis. The natural outlet for commerce and the natural source of manufacturing supply for the Eastern provinces are Boston and Massachusetts. All along our border there are great cities, like Buffalo, Rochester, Detroit, St. Paul, Minneapolis, Tacoma and Seattle, whose merchants think themselves entitled to as close trade relations with the portion of Canada to the north of them as with the portion of the United States to the south of them. The Canadian railroad system, therefore, will be enabled to make better terms in doing the through business of widely separated American cities with each other, not only by the fact that their routes are the shortest, but by the fact that they may naturally expect a local traffic which in this and in all other cases will enable them to perform the long transportation at less cost.

Michigan's connection with the East must be through Canadian territory, or must be by a long circuit. Her only railroad route to the East, save through Canada, is by the way of Toledo and around Lake Erie. The distance between Detroit and Buffalo, by rail through American territory, is 361 miles. The distance between Detroit and Buffalo through Canada by the Grand Trunk is 259 miles, more than 100 miles less. The distance between Port Huron and Buffalo through Canada is 198 miles. But from Port Huron to Buffalo through American territory the distance is 423 miles. I can conceive no good reason why the American people should not avail themselves of the shorter distances, the cheap construction, the level grades, which the Canadian railroads afford for their service, as they avail themselves of the Atlantic or Pacific Ocean, or of the lakes.

Millions have been expended by Canadians and by Englishmen to connect this system with the United States. Treaties and conventions have been entered into to favor the connecting of this system of roads with important points in this country, so that the American carrier may perform service for Canada and transcontinental service between Europe and the East on the one band, and the Canadian carrier may perform like service for the United States on the other. Great cities, great tracts of country, many individual manufacturers, merchants and farmers, are dependent not only for prosperity, but for their capacity to do business at all, on the continuance of this system of things. . . .

Now it is said that the Canadian railroads have an undue advantage over our own, because they are not subject to the provisions of the Interstate Commerce Law. The Canadian railroads challenge this statement, and earnestly assert that they comply with the Interstate Commerce Law in all respects, and that they are willing to submit themselves to any scrutiny, or to subject themselves to any penalty which will secure their obedience to that law. Without considering the justice or wisdom of the Interstate Commerce Law, in two great particulars, the prohibition of what is called pooling, and the prohibition to charge a larger sum for a short haul of merchandise than is charged for a longer haul over the same road, it seems clear that the Canadian law is better than ours in one respect. We leave the interpretation of the long and short haul clause to a commission in particulars which affect the prosperity of great cities and their foreign and domestic commerce when this interpretation ought to be declared by the law-making power and is declared by the law-making power in Canada. When the Interstate Commerce Law was passed, the conference committees of the two houses were asked whether they considered that the fact that two cities at the end of a railroad route had also a water route competing with it, which intermediate points on that route did not have, or the fact that Western freight destined to one point was to be carried to Europe, and Western freight destined to an intermediate point on the same route was intended for local consumption, constituted different conditions or circumstances, so that such cases would be an exception to the long and short haul clause of the law. On the decision of this question depends the prosperity of ports like Boston and Portland, and the power of Boston to take any share of the foreign commerce in competition with New York. The conferees on the part of the House declared that neither of these cases was different from the ordinary case, and that they made no exception to the operation of the law. The Senate conferees declared directly the contrary. So that this doubtful question to-day is dependent upon the construction given by the Interstate Commerce Commission. On the contrary, in Canada, the legislative power has determined this question for Canada by the following provision:

"No company, in fixing any toll or rate, shall, under like conditions and circumstances, make any unjust or partial discrimination between different localities; but no discrimination between localities, which by reason of competition by water or railway it is necessary to make to secure traffic, shall be deemed to be unjust or partial."

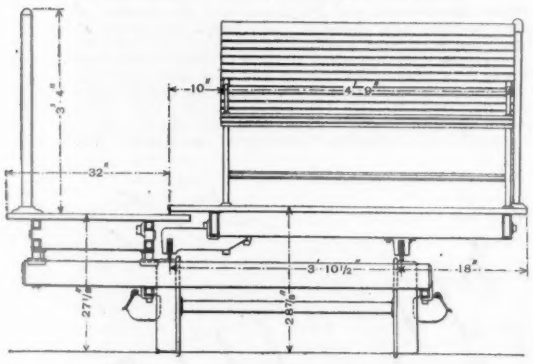
I do not believe that the extreme measure of requiring a license of the Canadian railroads to do business as part of lines connecting points in this country, and authorizing the abrogation of such license if they shall be held to have violated the Interstate Commerce Law, is either wise or necessary. The power should never be granted to any one man or any body of men to put a stop to the business of a great railroad. In such case it is not the railroad or its stockholders that would be the chief sufferer, but the men who have made their business arrangements dependent upon the service which the railroad is to render them. I do not believe that the great cities or the great manufacturing districts of New England, that Buffalo, Toledo, Rochester, St. Paul, Minneapolis, the great cities of the Northern Pacific, or even Chicago or New York, would long submit to such an arrangement.

It is said also that by helping build up the railroad system of Canada, we create what would be a great military danger to us in case of war with Great Britain. On the contrary, it seems to me that we are getting a hostage which will forever bind Canada and Great Britain, so far as she cares for Canada, to good behavior toward us. All the property which the Canadian railroads, or which Canadian or British capital have invested in connecting lines in the United States at once becomes worthless to them and a means of attack to us if war break out. . . .

It is said that the principle on which the protective

tariff rests requires us equally to exclude foreign carriers from our competition. It is unnecessary to discuss this theory. I do not believe that a popular majority, or a majority in either house of Congress, will ever be found to carry that principle to such an extreme as to reject altogether the use of foreign railroads. Indeed, such use is essential to the prosperity of many domestic enterprises. The Canadian railroad will help New England to get a Japanese market for her cottons, and to recover for them the Chinese market where she had a vigorous competition with England before the War. . . . The American railroad system is in no danger of being destroyed by foreign competition. On the contrary, foreign competition, like the competition by the great water routes when the lakes are open, exercises a healthy check upon railroad monopoly and extortion. It is to be considered, too, that if this business be permitted, not only a large amount of American transportation will be taken by foreign carriers, but a large amount of transportation for foreigners will at the same time be performed by American carriers. It is also true that the Canadian carrier will very often have a large interest to build up American cities, even at the expense of those of Canada. Indeed, loud outcries to this effect have already been made in Canada by the opponents of Sir John Maconald's government.

The American people, however, ought not to forget



Multiple Speed Railway—End Elevation.

that the American railroads are as much entitled to protection against foreign hostility or unfair competition as any other form of capital or of labor . . . The Canadian railway system is much more closely identified with the government itself than ours can ever possibly be. Indeed the Canadian Pacific Railroad was sometimes spoken of as the *alter ego* of Sir John Macdonald's government. The Canadian railroads cannot, therefore, undertake anything in the nature of a railroad war upon the railroads of the United States, or undertake to set at defiance the railroad policies established by our government without the connivance, if without the active support, of the Canadian Government. Such an attempt would be sure to arouse the combined opposition, not only of the American transcontinental railroads, but of all ships not directly dependent upon the Canadian railroad system, of all persons interested in maintaining our own railroad legislation, either state or national, and of our Administration itself. . . .

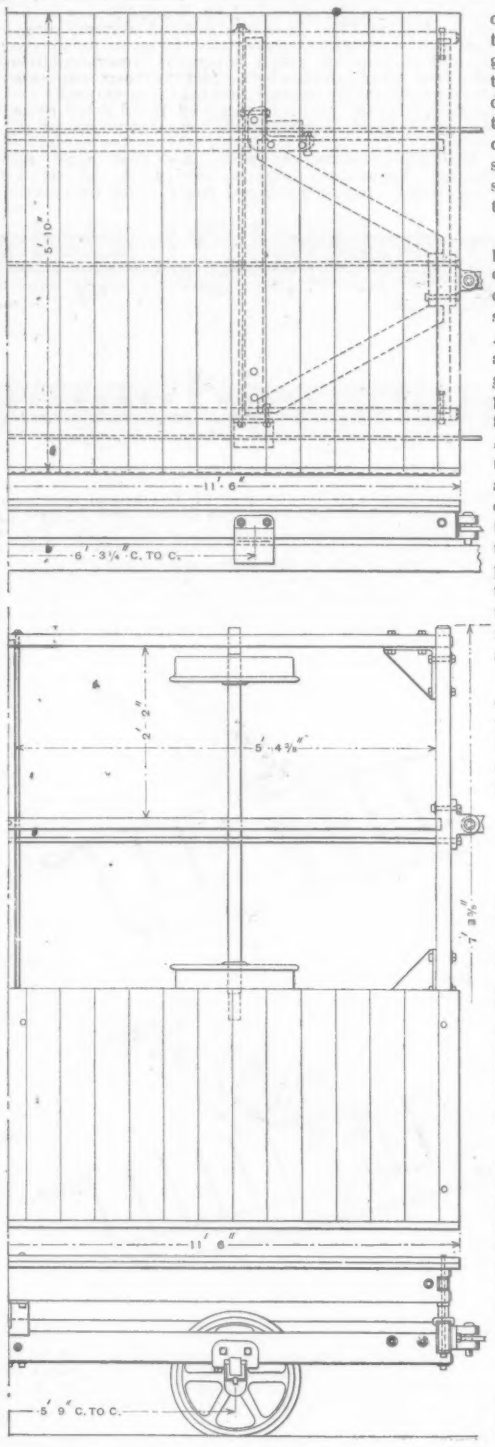
"Multiple Speed" Railroad for the World's Fair.

Messrs. Schmidt & Silsbee, the inventors of the "multiple speed" platform railroad which we have mentioned before, have permission to build a temporary structure, 900 ft. long, at one side of the World's Fair grounds on which to exhibit an example of their system until the fair is opened. The structure is a wooden trestle. The rails and rolling stock are made as follows.

There is an ordinary track laid 3 ft. 9 in. gauge, forming a complete circuit, but not of circular form; it is somewhat in the form of an ellipse. On this track runs a series of 18-in. wheels with flanges ⅜ of an in. high, ⅝ of an in. thick, and tread 3 in. wide. These wheels are mounted on axles having 2 in. × 4 in. journals. The journals are outside of the wheels. These axles carry oil boxes of the ordinary form, with brass bearings and Morris lids, which are attached by means of two bolts and suitable flanges and two longitudinal timbers which form the framing of the truck.

The truck frame consists of four longitudinal members joined at the ends by end sills and secured by cast iron corner brackets. The end sills of the truck have drawheads which are attached by means of bolts with one through rod from end to end. These drawheads are simple jaws and are connected by means of a solid link and two pins. The truck frame has a lateral extension, which is carried by the extended end sills. This lateral extension carries the platform, which is formed by 1⅛-in. boards with an angle iron edge. This platform, the truck frame, the axles and the wheels are all in one connection, and they all travel together at a speed of three miles per hour.

Running on the wheels already described and at a velocity twice as great as the truck below is a platform carried by steel rails ⅛ in. × 4 in. The rails are not attached to the platform, but are carried in grooved brackets. These brackets have steel shoes, on which the rail rests, with rubber above the shoes in the brackets. The rubber takes the place of springs on the platform. The rubber block is 5 × 1⅛ × 1⅝ in. This platform is the car proper and is carried along with the rail by the friction of the rail in the sockets. Each car or sectional platform has two brackets for the rails. The bracing of the platform of the car frame is shown in the engravings. The location of the seats, hand railings and can-



Plans and elevations of one-half of carand platform.

Multiple Speed Railway.

vas vestibule are also shown. The cars are separated and the open space is covered by a $\frac{3}{16}$ steel plate and canvas. The seats have cast iron ends with wooden seats and backs. They are arranged on the fast running platform only; the side platform has a series of iron pipe posts. Passengers enter only from one side to the moving platforms. The other side is protected by a wire netting and canvas vestibule.

There are to be seventy five cars, each 11 ft. 11½ in. long over drawheads and 75 platforms of the same length. The cars and platforms are made of white oak bolted together. The floor is of pine, tongued and grooved.

The floor of each car is to have a strip of 1 × 1 angle iron along its outer edge and a strip of coarse rubber clamped between the angle iron and the edge of the floor to act as a guard to prevent the toes of passengers from getting between the platform and the car. The floors of the cars and the platforms are prevented from chafing due to the movement of the covering plates by means of two strips of iron secured to the floors by screws. The cars on which the motors are placed are fitted up in the same manner as the other cars, except there is provision made for putting on pig iron to increase the traction, if necessary.

The following is a description of the operation of this peculiar platform: The trucks are a continuous link chain around the entire circuit of the track. They are driven directly on the axles by means of electric motors spaced uniformly throughout the length of the train. As the lower wheels revolve the side platform travels at the same speed as the trucks as they are attached together. This platform then travels at, say, three miles per hour. Passengers step upon it from stationary platforms at about the same level. The quick moving platform is carried on the periphery of the wheels of the trucks. As the top of the wheel moves along the track at a rate which is twice the rate of movement of the centre of the axle and the parts attached, it is evident that the second platform will move twice as fast as the first, or a speed of six miles per hour. When the passengers have reached the first platform they will be traveling at three miles per hour, and with a uniform motion it would be no more difficult to move from the three-mile platform to the six-mile than from the stationary platform to the first or three-mile platform.

The construction of this work is to be undertaken at once, and the contracts are let for the trestle work complete to the Remington Construc-tion Co., of Chicago; for 900 ft. of rolling stock to the U. S. Rolling Stock Co., and for the electric plant and motors, with fixtures, to the Thomson-Houston Electric Co.

The Leland Car Heater.

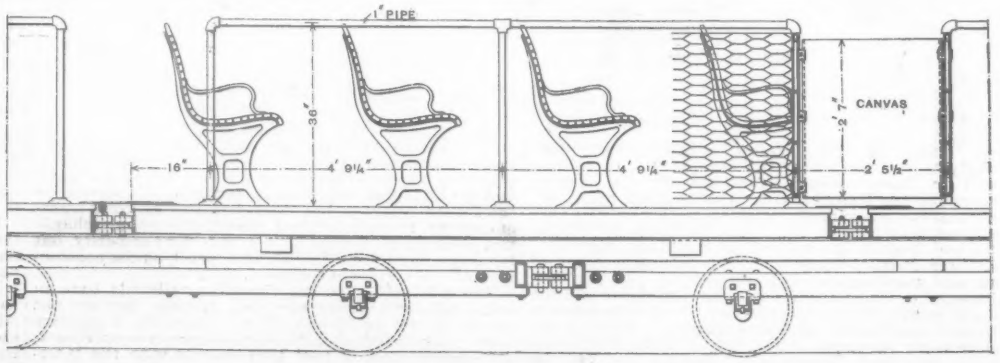
The engravings which appear herewith show the Leland Heater and its application to the cars of the New York, New Haven & Hartford Railroad. The plan consists of a new Leland water heater, (the construction of which is shown in the enlarged detail illustration), applied to supply heat to the water of the Baker system. The Baker plant remains intact and may be used if required, but placed immediately beneath the centre of the car are a pair of the Leland heaters shown at *L. H.* in the plan. Steam from the locomotive reaches the Leland heaters through pipe *F* and valves *C* and *A*, passing through the two heaters in succession.

The Leland heater consists of an outer water shell and an inner tubular steam shell. The steam to do the heating is admitted at the nozzle marked "steam inlet" in the enlarged illustration, circulates within the inner shell and about its tubes and passes out to a second heater or to a drip for condensed water. The water passes into the outer chamber through the nozzle marked "water inlet," and out of it through the nozzle marked "water outlet." It circulates through the heater tubes and on the outside of the heater shell, taking up the heat of the enclosed steam.

As shown in the car plan, the water in circulation passes along the whole of one side of the car. It then returns to the centre of the car, passes beneath the flooring to a Leland heater at the opposite side, through which it moves and passes up through the car floor to circulate along the opposite side of the car, and returns through a second Leland heater to the Baker plant.

The adoption of the Leland-Baker combination is the result of a test by the New York, New Haven & Hartford, in which it was shown that although the combination was applied to the last two of a train of six experimental cars, it effected a heating circulation in advance of the other cars, and kept up a required temperature in the two cars with steam pressure from the locomotive averaging between two and six pounds to the square inch.

The Leland heater may be applied to and inserted in any portion of a water circulation system for assisting in the heating. These heaters are manufactured by the Leland Car Heater & Steam Coupler Co., of 90 John street, New York City.



Multiple Speed Railway—Side Elevation.

Government Regulaton of Railroads.*

BY HON. A. SCHOONMAKER,

Ex-Commissioner of Inter-state Commerce.

Government regulation of railroads is by no means a recent exercise of public authority. It has been coincident with the operation of railroads alike in this country and in all others. But there has been great development in the character and extent of regulation. Regulation has taken no backward steps, but has advanced under pressure of public sentiment as urgent necessity has been found for it, and the chief object of government, the protection of the citizens, is not fulfilled without the due exercise of this power. It is, therefore, one of those duties of government which becomes a settled policy.

The power of the states to regulate corporate bodies of their own creation . . . is unquestionable. But while this power is supreme within the sphere of State jurisdiction, it has limitations, and among these is a very large part of the business done by railroads which cannot be affected by state regulation. Interstate and foreign commerce, not being within state jurisdiction, cannot be subjected to state regulation. The constitutional grant of power to Congress "to regulate commerce with foreign nations and among the states and with the Indian tribes," gives exclusive jurisdiction to the Federal Government over commerce not confined wholly within a state, and the state must yield to this superior authority. . . .

The power to regulate is ample and complete, and is a necessary and beneficial power of the Government. Without this subjection to Government control, an organized force of enormous proportions would exist in the country more potential than the Government itself, that might in the exercise of its powers, and, as experience has shown, very often would be destructive to many interests and ruinous to large bodies of citizens, while at the same time extending extraordinary advantages to others. . . .

The theory upon which commissions were at first created was that power to investigate and report would be sufficient; that exposure and publicity, under the influence of public sentiment, would effect the correction of wrongs and evils exposed. However plausible such a theory might be in the limited sphere of a single and long settled state, where railroads have not preceded its population, nor shaped its policy or its morals, and where an independent press exists, with courage to assail ascertained evils and enlighten the public mind, regardless of the agencies involved or the influences behind them, it is substantially impotent in the vastly extended fields of interstate commerce, and in territorial divisions where the conditions are materially different and where railroads are practically masters of the situation.

The special and prominent feature of transportation which, more than anything else inspired a demand for better railroad regulation and the creation of commissions to administer the laws, was unjust discrimination in its various forms. . . .

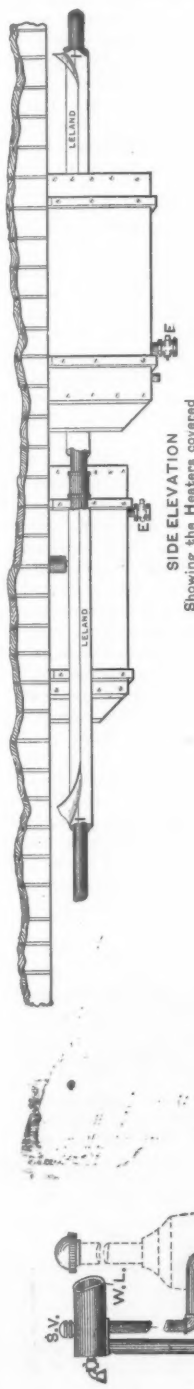
After several years of discussion and attempted legislation in Congress, the United States Senate in 1885 appointed a committee, under the chairmanship of Senator Cullom, to investigate the railroad business of the country. The investigation conducted by this committee was the most thorough and complete ever made, and the report of the committee, submitted in January, 1886, is a treatise on railroad transportation of great ability and interest. The committee in their report say that, "The provisions of the bill are based upon the theory that the paramount evil chargeable against the operation of the transportation system of the United States, as now conducted, is unjust discrimination between persons, places and commodities, or particular descriptions of traffic. The underlying purpose and aim of the measure is the prevention of these discriminations, both by declaring them unlawful and adding to the remedies now available for securing redress and enforcing punishment, and also by requiring the greatest practicable degree of publicity as to the rates, financial operations and methods of management of the carriers."

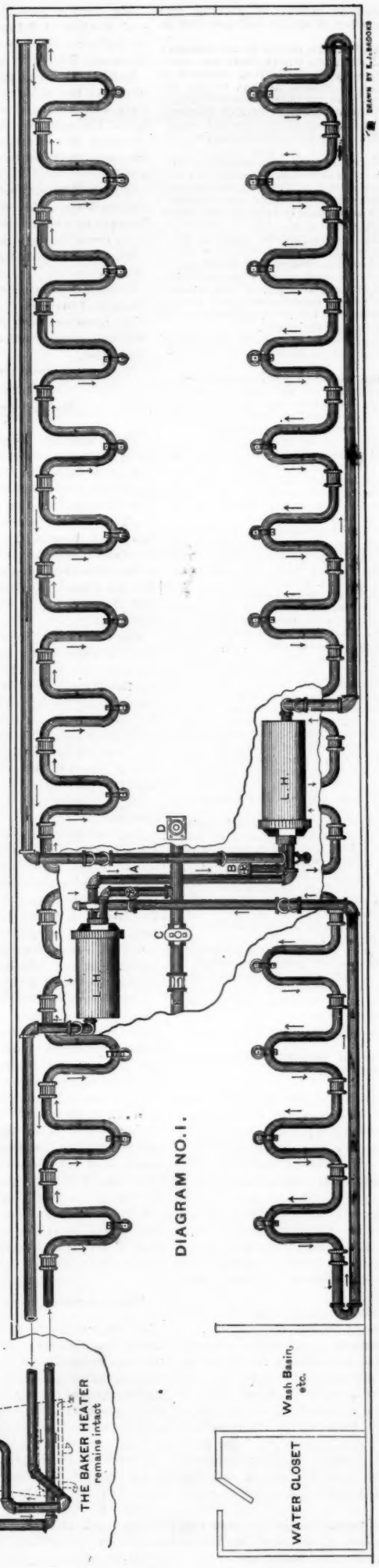
It is thus seen that the paramount public wrong of which railroads were found guilty, and intended by the committee to be corrected, was unjust discrimination, and that this was proposed to be corrected by declaring the discriminations unlawful, and providing remedies for securing redress and enforcing punishment; and also by publicity of rates, financial operations and methods of management. In other words, the remedies proposed dealt with the manifestations, or overt acts, and not with the cause from which the manifestations sprung.

The National Act to regulate commerce finally became a law Feb. 4, 1887, and became operative April 5 following. The measure was a compromise between conflicting views, and was not fully satisfactory to any of its framers, and still less so to the interest to be governed.

The administration of the law was devolved upon five Commissioners, with authority to appoint such employés as might be found necessary. The experiment of administering a law declaring a few sound principles as rules of conduct, dealing mainly with the symptoms of the disorder that lay behind them, leaving competition, the foe of regulation, unfettered, restricting the roads themselves from active co-operation with the public authorities by voluntary agreements to mitigate the evils of competition that experience had found useful, and in face of the hostility of most of the roads, was a task of the greatest magnitude and difficulty. On the part of the Commission the most serious embarrassment was want of power to make its action prompt and effective. It was closed with no authority to enforce its own decisions, and its findings were only *prima facie* evidence. The Commission was made a *quasi* judicial body, and at the same time a prosecuting body to enforce not only

* Condensed from the *Independent* of Sept. 3.

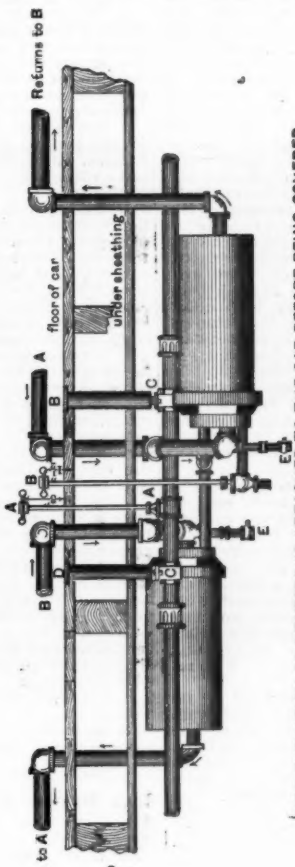




EXPLANATION OF VIEWS AND LETTERS
DIAGRAM NO. I.

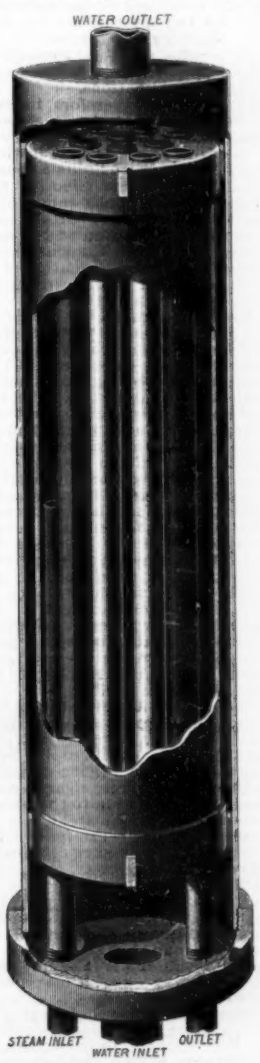
A Shows Steam Valves controls both Heaters operated in the car
B " " Drip " " " " " "
C " " Cock in main Line " " " " by Plate D Returns to A
D " " " Plate in the car
F " Main Steam line run the length of Car with Hose connections at each end
L.H. Are the Leland Heaters
The Arrow shows the course of the water, the Baker's Heater course of water the same way

THE LELAND SYSTEM As adapted to heating the passenger coaches of the N.Y. N.H. & H.R.R.Co.



SIDE ELEVATION OF HEATERS AS ATTACHED TO THE CAR BEFORE BEING COVERED

THE LELAND HEATER AS APPLIED ON THE NEW YORK, NEW HAVEN & HARTFORD.



The Leland Heater.

its own decisions, but the penal provisions of the law as well. These were two inconsistent functions. . . . .

Notwithstanding these obvious defects in the law, a great deal has been accomplished in the directions contemplated by the statute. Passing by the statistical work of the Commission, which is of great and permanent value, the administrative work in respect to rates or transportation charges has been important and useful. Innumerable corrections in classifications and rates have been made, discriminations in respect to localities, persons and traffic have been largely removed, rebates have become the exception instead of the rule, and equality between persons and places similarly situated has been nominally established. . . .

While it is true that there have been considerable reductions in rates under the act to regulate commerce, the object of that act was not to reduce railroad revenues. Official statistics abundantly show that the revenues of roads, both before and since the act, have not been excessive, but, on the contrary, have been insufficient in many cases to render the roads profitable. Over 61 per cent. of the railroad stocks of the country, and upward of 18 per cent. of the bonds, yield no dividends at all, and much of the balance only a very small return.

Very material public benefits, using the word public as distinguished from the railroads, have been accomplished, in spite of grave defects in the law. These are due largely to the innate respect for law by the American people, and to the conservative and moderate action of the Commission. If the roads themselves had cheerfully co-operated and observed the law in its spirit and letter, their own revenues would have suffered no loss, and they would have shared in the general benefits.

The theory upon which the act was constructed, and upon which laws for the regulation of railroads have hitherto been based, was that competition among railroads was of great public advantage, and that arrangements among roads that might appear to diminish the force of competition must necessarily be prejudicial to the public, and for that reason should be prohibited. This theory has been shown by experience to be unsound. Efficient regulation is incompatible with unrestricted competition. Competition undoubtedly has its uses, but competition in rates is not the only competition in which railroads may engage. Competition in facilities, in efficiency, and in the character of the service generally is legitimate competition and to be encouraged. But competition in prices for service, when carried below proper and just compensation, is of questionable advantage to the public, and injurious, if not ruinous to the roads. Competition is often productive of more evils than benefits. The ordinary competition in trade leads to a variety of evils with which the public is familiar, such as short weights and adulterations of the commodities sold. . . . By excessive competition between railroads both the roads and the public are injured, and the properties often become useless investments. The public is injured by the instability or fluctuation of rates, and by the inferior service rendered by the carriers. The carriers are injured by the direct loss of revenue that results, and their consequent inability to maintain their properties in proper condition and to meet their necessary obligations.

Competition, therefore, in transportation is a matter to be regulated and restrained. So far as it may be beneficial to the public and not injurious to the carriers it is entirely proper that it should exist; but when it goes beyond these limits a sound public policy requires that it should have effective restraints. The railroads themselves have long endeavored by their voluntary associations in various parts of the country to regulate destructive competition and to maintain stability and uniformity of rates. These arrangements have been given the unfortunate designation of "pooling." In England they are styled "joint purse arrangements." Federation would be a better term.

Pooling is defined by its friends and admitted by its opponents to be "a plan for preventing railroad wars and securing uniformity and permanency in rates." The only objection raised against it that has any force is, that, under pooling, rates may be too high. But experience has shown this to be substantially groundless, and under government supervision it is impossible. The strong argument in favor of pooling is that the physical conditions, both in respect to roads and business, render treaties or common arrangements for peace indispensable, and that the roads themselves then become co-operating factors in aid of regulating by the public authorities. Arrangements for these purposes, before they were prohibited by law, have usually been only temporary, for lack of legal sanction and power of enforcement, and have failed to accomplish permanently useful results. Legalized pooling in some form is an experiment yet to be tried. To the public, stability and uniformity of rates that are reasonable; that is, not too high to prohibit shipments, nor to deprive the producer or shipper of fair profits, are of the greatest importance, and they are not less so to the roads themselves. But how to maintain stable and uniform rates is the greatest problem in railroad transportation.

The law, as it now stands, is inadequate for the purpose. Such agreements as the roads may enter into under the law have been demonstrated over and over again to be also ineffectual. Something else remains to be done, therefore, that may bring about so desirable a result. It is entirely clear to every one who has given thoughtful attention to the subject, that the cause of ruinous competition and of instability and want of uniformity in rates, is the independent power of every railroad, or every system of railroads, in the country, to make and change rates, at its own will and pleasure, with no restraint whatever except the very feeble restraint imposed by the present law, of a notice of ten days for an advance in rates and of three days for a reduction in rates. The particular vice is that every road may make and change its own rates without regard to the public interests that may be affected, and without regard to the effect it may produce upon competitors engaged in the same business. And experience has shown that this power of establishing and changing rates at will is exercised in the main for the sole purpose of gaining business from competitors, with little concern whether the business when gained is profitable or otherwise. The cause of rate demoralization and railroad disaster being universally known and undeniable, the question that arises is, whether legislation should not be directed to the removal of the cause instead of wasting energy upon the results that may be produced, while the cause of the results remains active.

It is entirely plain that correction of the unjust discriminations, for which existing laws have been found ineffectual, and the removal of railroad demoralization generally, and the maintenance of stable and uniform rates, can only be secured by taking away or placing under proper restraints the independent power of every railroad to make and change rates at will. . . .

What particular form legislation should take in order to restrain this independent power of making and changing rates is only matter of detail, and may not be difficult to formulate.

Compulsory federation of roads, either in the country at large, or in territorial districts where there are competing lines, for the purpose of establishing common or competitive rates, subject, of course, always to the supervision of the government as to their reasonableness and freedom from discriminations, may be one method, and would only be substantially an extension and legalization of the work of the railway associations now in existence.

There may, also, be other methods which need not be enumerated. If compulsory federation of roads for the purposes indicated were required, with summary powers on the part of the Government to enforce the maintenance of the rates when once properly established until lawfully changed under like authority, the distribution of traffic among competing lines might be made a part of the scheme, or at least would be likely to follow as a mere incident of the situation, instead of being, as at present, the exclusive object aimed at as a panacea for railway disturbances. And one, at least, of the beneficial results likely to follow from such a condition would be the diminished inducement for the construction of merely speculative and piratical railroads.

These suggestions are not altogether novel, but have occurred to others who have given thought to the subject. . . .

Some general conclusions may be stated, as follows:

1. Governmental regulation of railroads is to be the permanent policy of the country, and will be exercised with such enlargements and increased efficiency as experience may show to be necessary.

2. The regulation established by the national law, while it has accomplished many good results, and has been especially useful in instructing the public mind in the principles of transportation and the duties and obligations of carriers, has been inadequate for the main purposes contemplated by the law, and is insufficient for other objects that ought to be accomplished.

3. The powers given to the Commission are insufficient for the highest, or, indeed, for any high degree of usefulness. It should have judicial powers, and should have authority to enforce its own decisions, unless appealed from to the courts of the United States.

Its findings, instead of being only *prima facie* evidence in some court, should be conclusive, with a right of appeal by the unsuccessful party upon the record before the Commission to the United States courts, instead of a re-trial in court upon original testimony. And there should be at least six sub or assistant commissioners, located in different portions of the United States, for the purpose of making informal and *ex-parte* investigations, and attending to prosecutions under the law.

4 The excessive multiplication of railroads beyond the needs of the business to be done is the cause of the irrational competition that in turn leads to the demoralization of rates and most of the unjust discriminations of which complaint is justly made. And the independent rate-making power is alike a cause of useless and therefore injurious railroad construction, and the source of the reckless competition and unjust discriminations that are practiced.

5. The independent power to establish and change rates at will by the several railroads engaged in interstate commerce should be taken away or brought under proper restraints, and such rates whenever competitive, should be established and changed only by concerted or joint action of railroads, subject to the ultimate supervision and control of the Government, and its authority to enforce their observance.

To quote Judge Cooley once more. In a recent and very deliberate utterance he says:

"The railroad problem will be dealt with effectually when the power to fix the rates for railroad transportation is placed upon such a basis that the evils now so prominent and troublesome and persistent, which spring from its exercise, shall be cured and the power itself brought under effectual regulation."

Road Masters' Association of America—Minneapolis Convention.

The Ninth Annual Convention of this Association met at Minneapolis, Sept. 8. The members in attendance were welcomed by Mayor Winston, who presented the keys of the city and was elected an honorary member of the Association. Mr. W. H. Stearns spoke in reply. The members were supplied with transportation over the local railroads.

Mr. T. M. Meade (Atchison, Topeka & Santa Fe) gave some statistics of Minneapolis. Forty-five new members were elected, making an active membership of 490. A circular letter will be sent to all General Managers of Railroads requesting their endorsement of the Association and its work.

Mr. Meade reported for the committee on track jacks. The committee on steel rails made no report.

The committee on standard frogs made a report recommending for main line turnouts a No. 10 spring rail frog for rails of 60 lbs. and over, the angle of rigid frogs for yards to be not less than No. 8. There was considerable discussion of this report in which Mr. Meade mentioned the use of No. 6½ frogs in the Kansas City yards. Mr. Adams of the Wabash uses No. 9 for main line work and No. 5 in his Detroit yards. Mr. Stearns of the Chicago & Northwestern favored a spring rail frog 15 ft. long, and has one that has been in track 12 years. The report was adopted.

Mr. Burnett presented a paper on the Construction and Maintenance of Spring Rail Frogs, and Mr. Ellis a paper on Standard Frogs. Mr. Murtaugh presented a report on rail joints.

Mr. Meade presented a report on Track Jacks. The report recommended a double acting compound lever jack, working half notches, with 12-in. lift. In the discussion that followed certain speakers favored a lighter jack with a 6-in. lift. Mr. Mandeville had used a friction clutch, but now uses the Barrett jack. Mr. Doyle favors a compressed air jack. Many speakers objected to a friction clutch as too slow in releasing, while light jacks were favored for section work and the "whiskey" jack for heavy work. The report was accepted.

Mr. Jordon presented the report on the Best General Method of doing Track Work with different kinds of Ballast. The report is long and very good. It was discussed section by section.

Section 11 recommended dressing the ballast even with the top of the ties for 2 ft. outside of the rails. This was amended to slope gravel and cinder 1 in. below the rails for the sake of quick drainage.

Section 13 recommended bending rails on all curves. This was amended to read for all curves of 3° and upward.

Section 21 prescribed that the section gang go over the section daily. This was amended to provide that the foreman or a competent man make the daily inspection. With these changes the report was adopted.

Mr. Black reported a design for a badge for the Association.

A committee of nine was elected to revise the constitution and by-laws.

The members have received many courtesies from the railroads of the northwest and from the city and local committee.

The exhibit was a large one.

Notes from the Bridge Shops.

The Union and Edgemoor Bridge Works no longer have the monopoly of the manufacture of steel eyebars, except, perhaps, for the heaviest sizes, where success is largely dependent upon long experience in manufacture. The Phœnix Iron Company is now equipped with the facilities for manufacturing and testing bars of any size for which there is likely to be a demand, and are successfully making bars 8 in. in width. The smaller sizes of bars are also being successfully made by the Pencoyd Works, Passaic Rolling Mill Company, King Iron Bridge and Manufacturing Company, and the Smith Bridge Company.

The New York, Susquehanna & Western Railroad is rapidly replacing its old wooden bridges with substantial iron structures. The largest bridge on the line is the overhead crossing of the Erie, at West Bergen, for which the contract has been let to the Edge Moor Bridge Works. The design calls for four heavy, double-track, skew, pin-connected through spans of about 100 ft. each. Work on the masonry foundations is well advanced and the erection of iron will commence about Sept. 15. There are also several contracts for plate girder bridges of 50 ft. span and less, placed with the Passaic Rolling Mill Company.

Many of the engineers of New England roads seem to favor lattice girder and plate girder bridges for spans less than 120 ft. Of this work the Boston Bridge Works has the lion's share, but a considerable number of contracts have been let to shops outside of New England. The Boston & Maine has recently had built heavy plate girder spans at the Pennsylvania Steel Company and Pencoyd Iron Works, and the Maine Central now has building at the Passaic Rolling Mill six bridges, comprising six lattice girder and five plate girder spans.

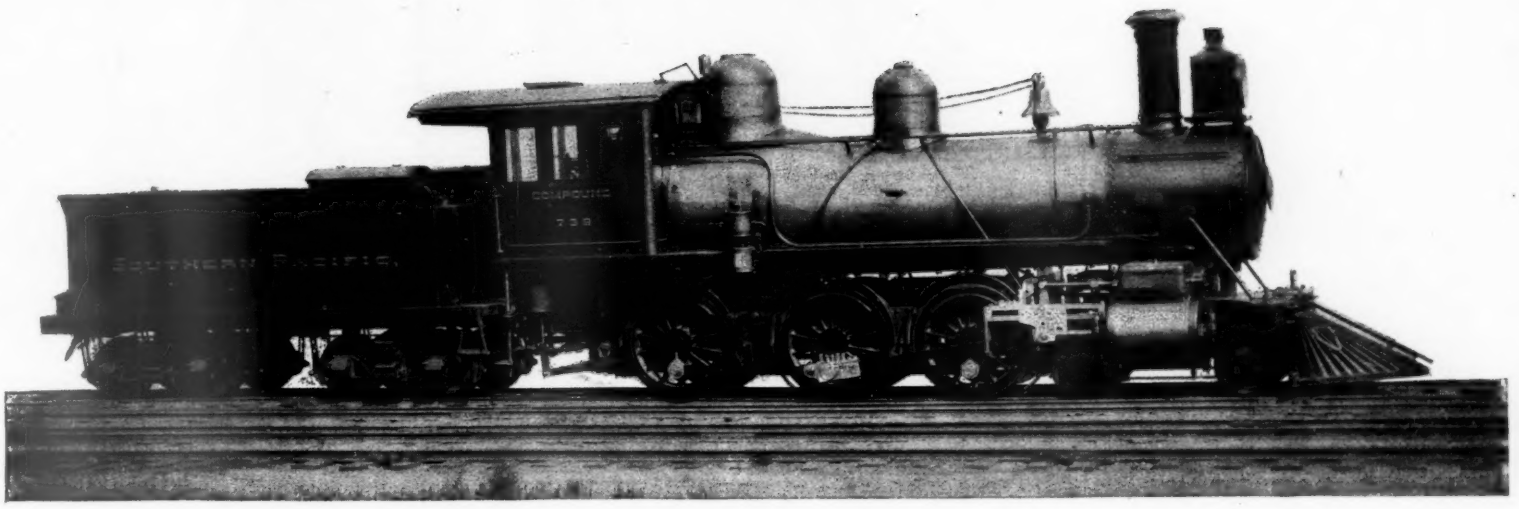
The Wrought-Iron Bridge Company, of Canton, has received the contract to build a bridge for the Great Falls Water Power Company, of Great Falls, Mont., comprising seven spans, 125 ft. each. These shops have just shipped the Duncan avenue bridge for the city of St. Louis—a plate girder of 50 ft. span, weighing 90 tons.

The Passaic Rolling Mill has contracts from the D. L. & W. R. R. for a 200-ft. pin connected span, and six plate girder spans. Also the Forsythe street bridge for the city of Atlanta, Ga., for which proposals were recently asked, and considerable roof and building work from the Home Brewing Company, of Newark, and the Lackawanna Iron & Coal Company.

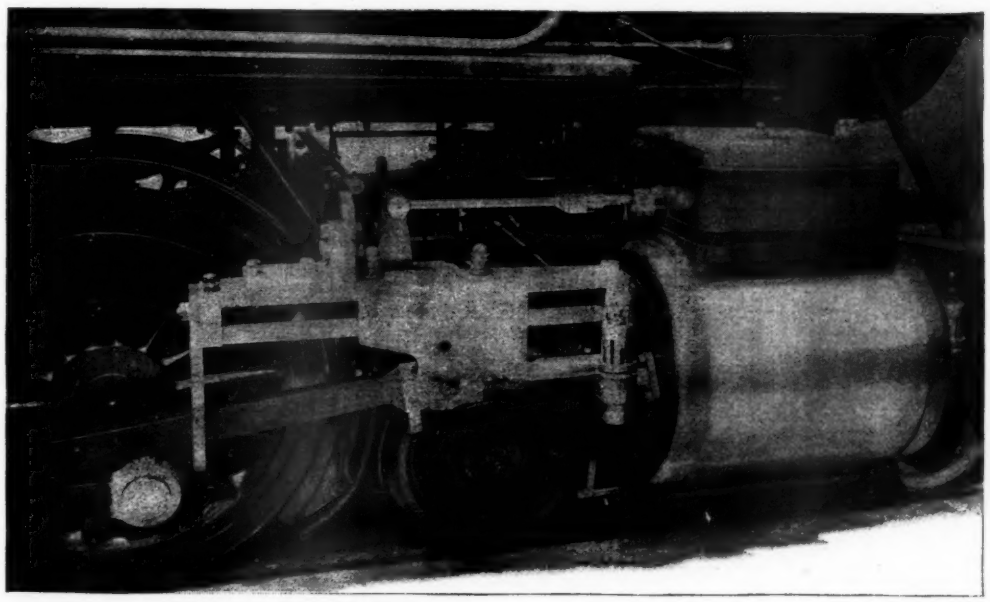
There is a report current to the effect that C. P. Huntington will establish a bridge shop for the special purpose of building bridges and structural work for the Southern Pacific and other roads controlled by him.

Steam Locomotives Supplanted by Electricity.

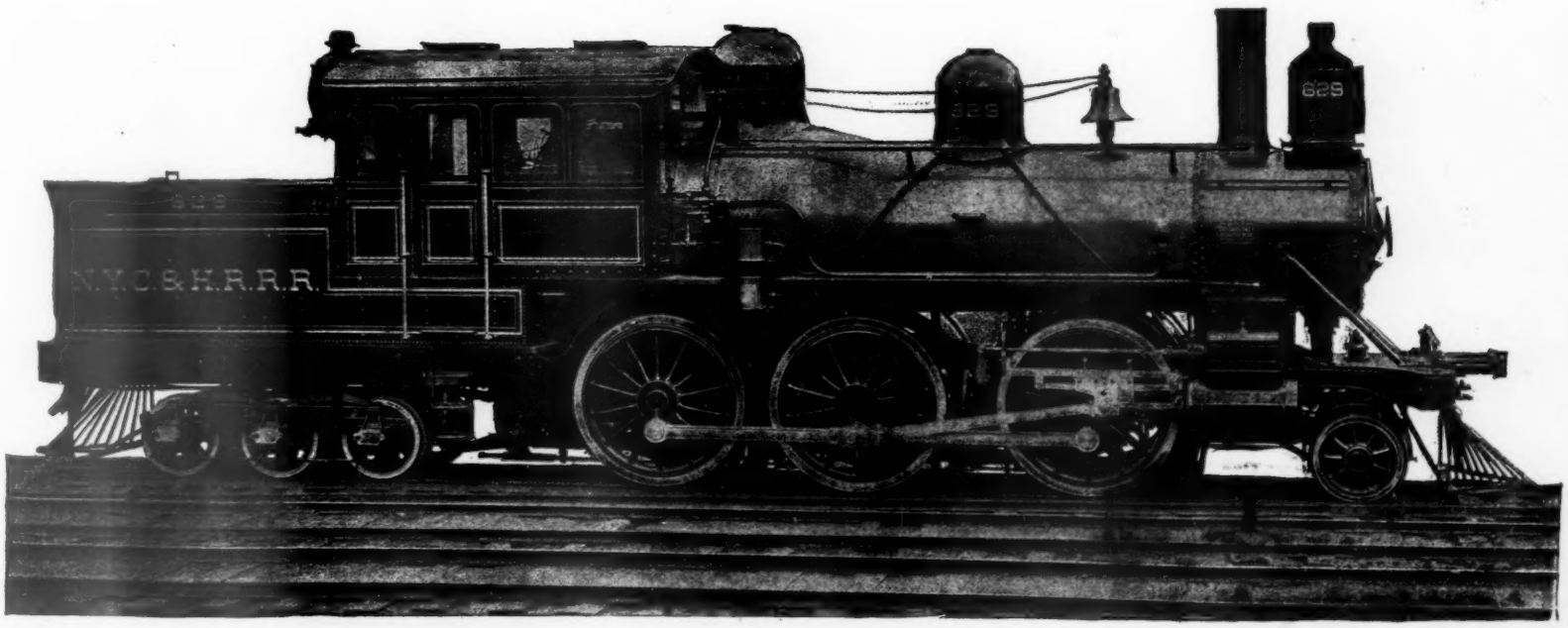
The lines of the St. Louis & Suburban Railroad, at St. Louis, Mo., including the narrow gauge steam road, are to be operated wholly by electricity, and the company advertises its narrow gauge engines and cars for sale. This road comprises the old "West End Narrow Gauge," and what was formerly the St. Louis Cable & Western. The original terminus of the West End was west of Grand avenue, from which it was formerly worked in connection with the Olive street horse car line. Later the St. Louis Cable & Western was organized, and the two were worked together. The cable road from Grand avenue to the centre of the city was opened in 1886, but it was unfortunate in location, and costly in operation, and finally succumbed, the whole being reorganized as the St. Louis & Suburban. The steam line, single track, narrow gauge, from Grand avenue to Florissant (northwest, in St. Louis County), is 16 miles in length. The cable, in the city, was 3.2 miles long, from Sixth and Locust streets to Grand avenue and Morgan street. This has all been prepared for operation by the Thomson-Houston electric system, the wires being nearly all up. The line will be made all of one gauge, and the company expects to have 120 new cars and motors, laying aside entirely the old equipment. The opening of this line as an entirety is practically bringing an important passenger railroad right into the



10-Wheel Compound Freight Locomotive for the Southern Pacific Company.



10-Wheel Compound with Pitkin's Improvements.



Tank Locomotive for Suburban Traffic, New York, Central & Hudson River Railroad.

TWO RECENT LOCOMOTIVES BY THE SCHENECTADY LOCOMOTIVE WORKS.

heart of the city. The terminus is two blocks south of the Lindell Hotel, on Sixth street. The line passes the post office two blocks further west, and the company will carry mails and express freight, as the steam division has been doing all along. The date of beginning operations has not been fixed, but the preparations are going forward rapidly. Florissant is an old French village in a pretty valley near the Missouri River.

Master Car Builders' Association Standards.

The following are the results of the canvass of letter ballots ordered by the M. C. B. Association at the last convention. The recommendations of the committees which are thus disposed of may be found in our issues of June 12 and June 19.

Subject.	Affirmative.	Negative.	Total votes.	Necessary to carry.	Result.
Lettering freight cars.....	340	225	565	377	Rejected
System of joint inspection, form of inspection agreement and rules.....	360	207	567	378	"
Form of report of defective cars received and delivered	369	198	567	378	"
Joint inspection defect card.	346	221	567	378	"
Air brake standards, change in diameter of pins from $1\frac{7}{8}$ to $1\frac{5}{8}$ inch.....	530	36	566	378	Adopted
Rescinding the former adoption of the Fletcher lid.....	417	149	566	378	"
Journal box, bearing, wedge and lid for 60,000-lb. cars...	365	176	541	361	"
Lid for old standard journal box.....	378	159	537	358	"

TECHNICAL.

Manufacturing and Business.

The Standard Nut Lock Co. has been formed in New Jersey with a capital stock of $100,000, for the manufacture of nut locks. The stockholders are A. M. Ake, W. W. Blanchard, E. Harrison and F. C. Blanchard, of Newark, N. J.; and W. A. Redding, of Brooklyn, N. Y. The office of the company is in Newark.

The Lewis Foundry & Machine Co., of Pittsburgh, recently shipped to the Washburne & Moen Manufacturing Co., for use in its new plant now being erected by the Berlin Iron Bridge Co., of East Berlin, Conn., at Waukegan, Ill., three five-ton swing cranes, two 16-in. Frank patent hydraulic cranes, and one 24½-in. accumulator; also a 22,000-lb. shear and engine for the Richmond Locomotive Works, at Richmond, Va.; and a special saw-band rolling mill for Singer, Nimick & Co., at Pittsburgh, Pa.

The National Pipe & Tube Co., recently incorporated in New Jersey, completed its organization in Boston, Sept. 3. The company includes a combination of the National Tube Works, of Boston, the largest company of its kind in the world; the Republic Iron Works, of Pittsburgh; the Monongahela Furnace Co., of Monongahela, Pa., and the Boston Iron & Steel Co. The business will be the manufacture and sale of iron and steel pipes, tubes, muck bars, etc. The capital stock was originally $10,000, but has been increased to $11,500,000, of which one-half is preferred and one-half common. The directors are: Edward W. Converse, David H. Hitchcock, Wm. S. Eaton, P. W. French, Edmund C. Converse, W. J. Curtis, of Sullivan & Cromwell, New York lawyers; J. H. Flagler, of the Standard Oil Co., and T. E. Sweetser. Edward W. Converse is President; David W. Hitchcock, Vice-President; Wm. S. Eaton, Treasurer; P. W. French, Secretary, and Edmund C. Converse, General Manager.

A cargo of railroad machinery, valued at over $150,000, was recently shipped from Philadelphia to Brazil intended for new railroads building in that country.

The contract for building a new cable driving plant for the New York & Brooklyn Bridge has been awarded to Robert Pool & Sons' Co., Baltimore, Md., who will furnish everything except the engines, which will be built by William Wright, of Newburg, N. Y.

The National Pipe Bending Co., New Haven, Conn., manufacturers of the National Feed Water Heater, report sales of over one hundred of the National Heater, during June and July, among the sales being: one 300 H. P., National Transit Co., Milway, Pa., two 150 H. P., New York City; one 150 H. P., John Duncan, Fort Howard, Wis.; one 500 H. P., Mankato, Minn.; one 800 H. P., Sir Titus Salt, Baronet, Sons & Co., Ltd., Bridgeport, Conn.; one 500 H. P., Brooklyn City Railway Co., Brooklyn, N. Y.; one 400 H. P., South Norwalk Electric LightCo., South Norwalk, Conn.; one 200 H. P., Chattanooga & North Side Railway Co., Chattanooga, Tenn.; one 300 H. P., Glen Echo Railway Co., Washington, D. C.; two 300 H. P., Baltimore Copper Refining Co., Canton, Md.; one 200 H. P., Baltimore Copper Refining Co., Canton, Md.; one 500 H. P., Altoona, Pa.; one 300 H. P., Edison General Electric Co., Atlanta, Ga.; one 200 H. P., Paris Oil & Cotton Co., Paris, Tex.; one 500 H. P., Holyoke Water-Power Co., Holyoke, Mass.; one 250 H. P., Mecklenburg Iron Works, Charlotte, N. C.; one 150 H. P., Eureka Silk Co., East Hampton, Conn.; two 300 H. P., Campantia Nacional de Forjos e Estalieros, Rio Janiero; two 100 H. P., Basic City, Va.

The Chicago Street Car Heating Co. has filed articles of incorporation with the Secretary of State, at Springfield, Ill., for the purpose of manufacturing street car heaters. The capital stock is $100,000, and Byron E. Van Auken, J. A. Long, and S. L. Roberts, are the incorporators.

Iron and Steel.

Citizens of Birmingham, Ala., have subscribed $102,000 for the erection of a $1,000,000 steel plant at that place.

The ordnance department of the Bethlehem Iron Works, Bethlehem, Pa., will build an addition of 300 ft. to the machine shop.

The McConway-Torley Co., manufacturers of malleable iron castings, at Pittsburgh, have added to their works a Babcock & Wilcox boiler, equipped with a Roney stoker; they have also put in a corliss engine of 150 H. P. This company recently placed in its works an Archer gas producer, which, if found to work satisfactorily, will probably be adopted, and the use of natural gas discontinued.

Carnegie, Phipps & Co., of Pittsburgh, were the only bidders for supplying the Navy with ten 2¼-in. plates for Cruiser No. 6, at 12 cts. per lb.; eight 2-in. and sixteen 1-in. plates for the Washington Navy Yard, and six 1-in. plates, at 11 cts. per lb., for the Norfolk and New York yards.

The Oliver Coke & Furnace Co., has recently been incorporated in Pennsylvania by David B. Oliver, Henry Roberts, James B. Oliver, Stephen W. Tener and Charles D. Frazer, all of Pittsburgh, to build 300 coke ovens near Uniontown, Pa., the output of which will be used by the Oliver Iron & Steel Co., which is operated under lease by this firm, at its Edith furnace, in Allegheny, and Rosena Furnace, at New Castle, Pa.

The Leechburg Foundry & Machine Co., of Leechburg, Pa., has closed a contract with Wallace, Benfield & Co., Limited, proprietors of the Irondale Rolling Mill, at Irondale, O., for the erection of a 22-in. plate mill, with equipment consisting of doubling shears, trimming shears, annealing furnaces, pickling machine and machines and castings required in fitting up six tinning stacks. A great part of this machinery was designed by the Leechburg Foundry & Machine Co. It is expected the plant will be ready for operation by Nov. 1, and will have a capacity of turning out about 300 boxes of tin plates per day. The same firm have also received an order for a roll lathe from the Reeves Iron Co., Canal Dover, O., and are also building a cooling table for the Otis Iron & Steel Co., Limited, of Cleveland. The company has also delivered to the Belmont blast furnace a skelp mill intended to roll as wide as 20¼-in. steel grooved skelp plate; the rolls which accompany the mill are designed for 22¼-in. plate. The mill is equipped with a set of automatic tables designed by Wm. H. Maddock, M. E.

The Lockhart Iron & Steel Co. has entered into a contract with Alex. Laughlin & Co. for two fuel gas producers for its plant at Chartiers.

The Mexican Industrial Co., of Chihuahua, Mex., has received an order for the construction of one 10-in. and one 12-in. combination roll train, one heating furnace, a scrap furnace, one puddling furnace and a 5-ton hammer. The company proposes to manufacture merchant bar from native scrap iron.

The Briggs Rolling Mill Co., of Findlay, O., will erect a muck mill and merchants' department building adjoining the line of the Toledo & Lake Erie road, to be 280 × 300 ft., two stories, and to cost $10,000.

The Waukegan Iron & Steel Castings Co. has been organized at Waukegan, Ill., and is now preparing for business and will probably be in operation by Nov. 1. The company contemplates introducing the Bates process for steel castings.

The South Pittsburgh (Tenn.) Pipe Works has increased its capital stock from $100,000 to $200,000.

The Mahoning Valley Iron Co., of Youngstown, O., has leased the Wheatland Mill, at Wheatland, Pa., and it will run the mill double turn, which will give employment to about 200 men.

The stockholders of the Elliott Knob Iron Co. recently met at Staunton, Va., and elected the following officers: President, F. F. Cinnoth, of New York; Vice-President, F. G. Frick, of Pittsburgh; and Secretary and Treasurer, H. M. Wegner, of Staunton.

J. T. Ambrose, J. N. Carreger, F. A. Stratton and T. M. Allen, of Allentown, Pa., have formed a company to build a steel plant at Allentown. The works will include a main building 90 × 90 ft., and a building 30 × 35 ft. to be used in producing gas to supply the ovens. The plant will have a capacity of 30 tons, and is to manufacture steel by the Conly process.

The Pittsburgh Steel Casting Co. has just made at its works an immense Bessemer steel rim 15 ft. in diameter, intended for the driving wheel of the engine now building at the Robinson-Rey Mfg. Co., for the additions to the plant of the United States Iron & Tin Plate Mfg. Co. at Demmler. The casting in the rough weighs 24,000 lbs. and is perhaps the heaviest Bessemer steel casting ever made. The steel was blown under the personal supervision of Mr. Stuart Johnson, Superintendent, and tests have shown it to be entirely satisfactory.

The Rail Market.

Steel Rails.—The market is firm. Pittsburgh quotes $30, f. o. b. at mill, with mill at Braddock well sold ahead; New York continues to quote $30.75, tidewater.

Old Rails.—Old iron rails are quoted at Pittsburgh at $23.50@$24, and old steel at $17@$17.50, and Chicago quotes old iron rails at $23, and long lengths of old steel rails at $15; short lengths $14@$14.50.

The Electric Cables Through the Gothard Tunnel.

The two cables laid through the Gothard tunnel during the winter of 1881 to 1882 have been found insufficient for the increased traffic, and recently there have been laid two additional cables for the telephone service, one containing three separate conductors and the other two conductors arranged concentrically. The experience gained with the old cables (one a seven-conductor telegraph and the other a single conductor signal cable) has not been quite satisfactory. These cables were laid in an iron trough fixed on one side of the tunnel, and it was found that the water which accumulates in the trough where it sags between the supports had an injurious effect on the insulation. To determine the nature of this effect 150 samples of the water were analyzed, and in many cases found to contain sulphureted hydrogen and sulphates. Moreover, it was found that owing to the slower combustion in the air of the tunnel the smoke from the locomotives contains considerable quantities of ammonia and sulphurous acid, which, together with the carbonic acid, are absorbed by the water. It was therefore determined to abandon the previous method of laying the cables in a trough, and to lay them directly in the ground. The old cables have also been relaid in this manner. A trench about 2 ft. in depth was dug and filled, first with 2½ in. of gravel, then 2½ in. of sand. Upon this were laid the four cables, and covered with 9 in. of sand, covered by granite flags, and the rest made up with ballast.—*Inst. C. E., Abstracts of Papers.*

Heating Passenger Cars in Maine.

The Maine Commissioners have issued the following: The Public Laws of 1889 provide that "no passenger, mail or baggage car, on any railroad in this state, shall be heated by any method of heating, or by any furnace or heater, unless such method or the use of such furnace or heater shall first have been approved in writing by the Board of Railroad Commissioners." . . . . "and that in no event shall a common stove be allowed in any such car." Evidently the Legislature intended by enacting the foregoing provisions of law, to reduce, as far as possible, the danger of passengers, in case of accident to trains.

This board in their report of 1890 said: "In obedience to the provisions of Chapter 275 of the Public Laws of 1889, railroad corporations have generally discarded the use of what would reasonably be termed common stoves, for heating passenger, mail and baggage cars, and steam direct from the locomotive has been generally substituted as a means of heating, though other methods of heating, but little safer than the common stove, are still in use on many railroads in this state. While this fact would seem to be a violation of the provisions of the statute, which is being permitted by the board, we can only give as an excuse the one we gave in our last annual report," viz:

"The board, upon investigation, found that a statute, similar to the one enacted in this state, had been in force in the states of Massachusetts and New Hampshire, and that the Railroad Commissioners of those states had approved all methods of heating cars, other than by what might be called 'common stoves.'" Feeling, however, that the most stringent regulations should be adopted to provide for the safety of passengers, and to comply with the spirit of the law, and inasmuch as improvements have been made in some of the devices for heating cars now in use, the board hereby give notice to all railroad corporations operating railroads in this state, and to all manufacturers of car heating devices, that after the expiration of the time limit of the approvals now in force, viz: June 30, 1892, no method of heating cars will be approved, which, in the opinion of the board, will not reduce the danger by fire, to passengers and employés, to a minimum.

The Simplon Tunnel.

The Jura-Simplon Company has completed plans for the construction of the Simplon tunnel. They are for a single track tunnel, 24 kilometres long, and it is expected to have it finished in five years. The Swiss Federal Council will open negotiations at once with the Italian Government for the purpose of making a definite treaty to carry out this work.

Elevated Railroad Extension in Berlin.

The municipal authorities of Berlin are considering the question of extending the elevated railroad system of that city and suburbs and operating it by electricity. The system under consideration will include eight lines, making a total of 56 kilometres, and is estimated to cost 84,000,000 marks.

Steel Water Pipes.

As a further example of the development in the line of making water, gas, and other pipes of iron or steel sheets riveted together, it is interesting to note that in the contemplated extension of the water supply system of Paris, France, sheet steel tubes are to be used. There is to be a total length of pipes of about 12,000 ft., the diameters ranging from about 4 to 6 in. The pipes are to be furnished in lengths of about 20 ft.

Freight Car Couplers.

The Williams Car Coupler Co., Rookery Building, Chicago, has recently received orders for 1,400 couplers; 400 for the Minneapolis & St. Louis for 200 cars being built at Terre Haute, 500 for 250 cars for the Burlington, Cedar Rapids & Northern being built at the Peninsula Car Works, and 500 for another lot of 250 cars for this road at the Michigan Car Works. It is stated that these couplers were purchased because of the peculiar feature which causes them to unlock automatically whenever the draw rigging pulls cut, thus allowing the train to part without pulling the drawbar out where it can fall upon the track.

To Tunnel the Seine.

In view of the success attending the operation of the tunnel under the River Thames, at London, and of the St. Clair tunnel in this country, M. Berlier, a French engineer, has advanced a proposition for a similar undertaking under the River Seine, to accommodate the tracks for the railroad shortly to be built from Havre to Port Andemer. The Seine, at the point held in view for the tunnel, is 4,500 metres, or about 14.760 ft., wide. Berlier proposes the adoption of what has become known as the Greathead tunneling system for the work, the tunnel to be of the tubular type, built up of iron sections.

Car Heating.

The Leland Car Heater & Steam Coupler Company, of New York, has an order to equip the cars of the Housatonic and the Shepaug, Litchfield & Northern with its heater, which is described on another page of this issue.

Pneumatic Gates on the Erie.

The Erie is erecting at various highway crossings two story towers for the gatekeepers. The primary object is to keep the flagman away from his cronies, who absorb more or less of his time and attention so long as he is on the ground. The company has bought several gates from the Pneumatic Gate Company of Chicago, and will gradually introduce the use of them, when the same towers now building will be available.

The Moenchenstein Bridge Accident.

Foreign journals, notably the *Schweizerische Bauzeitung*, continue to devote considerable space to matters relating to the Mönchenstein bridge accident without, however, adding anything particularly new to what has already been published. One of the latest contributions to the literature of the subject has been made by Professor Fr. Engesser, of Carlsruhe, Germany, in the *Deutsche Bauzeitung*. In this he attempts to show that insufficient stiffness of several of the compression members was the primary cause of the bridge failure. From all that has become known of the design and construction of the bridge, it seems to be pretty generally concluded that it is not so much an explanation of the breakdown that is needed, as an explanation of the circumstance that an accident did not occur at a much earlier date.

The St. Clair Tunnel.

The Sarnia *Canadian* is authorized to contradict the dispatch sent out by the Associated Press last week anent the opening of the St. Clair tunnel. The story as given was the work of somebody's inventive imagination. There will be no banquet in the tunnel, no tables set on the boundary line and no brass band playing national tunes at either end. There will be a banquet, but it will be given in the freighthouse at Sarnia station. The opening day has not yet been proclaimed as a holiday in Sarnia or Port Huron. It is intended that Sarnia and Port Huron shall, as municipalities, participate in the tunnel opening celebration, but as yet no definite programme has in either place been decided on.

RAILROAD GAZETTE

Published Every Friday,
At 73 Broadway, New York.

EDITORIAL ANNOUNCEMENTS.

Contributions.—*Subscribers and others will materially assist us in making our news accurate and complete if they will send us early information of events which take place under their observation, such as changes in railroad officers, organizations and changes of companies in their management, particulars as to the business of the letting, progress and completion of contracts for new works or important improvements of old ones, experiments in the construction of roads and machinery and railroads, and suggestions as to its improvement. Discussions of subjects pertaining to* ALL DEPARTMENTS *of railroad business by men practically acquainted with them are especially desired. Officers will oblige us by forwarding early copies of notices of meetings, elections, appointments, and especially annual reports, some notice of all of which will be published.*

Advertisements.—*We wish it distinctly understood that we will entertain no proposition to publish anything in this journal for pay,* EXCEPT IN THE ADVERTISING COLUMNS. *We give in our editorial columns* OUR OWN *opinions, and those only, and in our news columns present only such matter as we consider interesting, and important to our readers. Those who wish to recommend their inventions, machinery, supplies, financial schemes, etc., to our readers can do so fully in our advertising columns, but it is useless to ask us to recommend them editorially, either for money or in consideration of advertising patronage.*

Judge T. M. Cooley has sent to the President his resignation as Interstate Commerce Commissioner. This has seemed imminent for a year or two because of his delicate health; but now that it has come, it will be deeply regretted by those railroad officers and others who at all appreciate the magnitude of the matters with which the Inter-state Commerce Act deals, and the immense importance to the whole nation of having those matters considered justly and wisely. It has been fortunate for the railroads and the people that Judge Cooley was the first chairman of the Commission and that his colleagues were so wisely selected. Their work was not only important, but it was novel and ill defined. They had to make interpretations and create precedents They had to direct our first steps in regulation of railroads by the general government. To this work Judge Cooley brought great ability, some actual experience in railroad management, the fruits of deep study of railroad problems, an incorruptible character and the long record of a distinguished career. He elevated the office, and secured respect for the findings of the Commission from the start.

The elevator law passed by the state of North Dakota a year ago, arose from the old antagonism between the farmers and the elevators, the former claiming that the latter took such advantage of the farmer as to amount to partial confiscation. The law declares that all grain elevators are public warehouses and therefore fully responsible to the state; that elevator accounts shall be open to inspection; that elevator men shall practically guarantee prices, and that all grain in North Dakota elevators shall be graded according to the rules of the board of railroad commissioners and shall pay a fixed scale of prices. There has always been grave doubt about the constitutionality of this North Dakota Act and both elevator companies and railroads are strongly opposed to it. The latter seem determined to force the question and have instructed their agents to refuse to open cars to the state inspectors. The latter reported their refusal to the board and the attorney general has asked for a mandamus, so the whole matter will soon get before the court. The inspection is a needless thing, for the grain must be sold in Duluth or Minneapolis according to the grades there, regardless of the findings of the home officers. Besides, there would be a block of cars throughout the state if all cars and trains were to be held while a few inspectors were going from one place to another. There may be a real grievence but the proposed remedy is absurd.

It is evident from the latest orders for box cars by the Chicago, Burlington & Quincy Railroad, mentioned in another column, that this road intends to adhere to the recent decision regarding the height of the floors of its cars. Our readers will remember that not long ago we called attention to the change made by this road in lowering the main sills to the place occupied by the draft sills. This required putting the draft rigging between the centre sills and allowing the drawbars to pass the end sills. At first it was feared that the end sill would be weakened, but actual service has shown the construction to be stronger and to hold up better than when the drawbar is below the end sill. The decreased height of the floors has been proved to be an advantage on the "Q." and there are no difficulties developed by the continued use of this design of car. On the other hand, the advantages are manifest; the cars have 8 in. more clear height inside for the same total height, and they are lighter and stronger, all of which points to this change in design as one step ahead in car construction that may be followed by other roads with advantage to themselves. We know of several roads that are contemplating making this change, which is the second one in which the C., B. & Q. motive power department has taken the lead during the past four years; the first was a deeper camber of the side truss rods, with a greatly increased bearing of the truss rod washers on the end sills.

In another column is a description of the novel form of continuous tramway to be built by the Multiple Speed Traction Company of Chicago for trial in the World's Fair grounds. The entire structure is to be removed before the opening of the fair. The structure is elevated, built on a wooden trestle and provided with guards for the wheels fixed in a manner similar to those used on elevated roads. This scheme has been under development for about a year and a half, and has seen many changes during that time. The original plan was to use wheels of different diameters on the same axle, which necessitated four wheels per axle and considerable complication. The rails were strips of metal laid flat. The next step was the invention of the flexible rail, so-called, that would bend to the curve of the track. Then the additional wheels were discarded and the device was reduced to the simpler form shown in the illustrations. The most difficult problem in connection with this has been the joints for the flexible rail. Several designs were proposed and discarded. Now it has been decided to do away with the joints entirely and to weld the rail in one piece for the entire circuit. As the rail expands it is expected that it will travel further in and out upon the tread of the wheels. Of course, there are many features of this scheme which are yet in an experimental stage, and the flexible rail is one of them. The whole arrangement is ingenious, and is worth trial at least for exhibitions and fairs where a large number of people travel continuously during certain hours. When used in inclosed areas there may be some question as to the noise that the numerous wheels and parts will make, but in the open air on earth foundations, at a speed of three miles an hour for the trucks, the noise ought not to be so loud as to be objectionable. It certainly will be a curious sight to see a series of cars traveling at a speed of six miles per hour while the trucks move at half that speed.

Chicago papers announce that the Erie (in connection with the Delaware & Hudson and the Fitchburg) is to run second class sleeping cars between that city and Boston once a week. It is given out that the experiment is to be worked so as not to interfere with the Erie's first class business. This is doubtless true, and a car that runs only once a week will certainly be an innocent innovation. If people can be made to wait a week for this car and there are enough of them to fill it every trip it will be useful and profitable; but if it succeeds to this extent it will have to be run oftener, and then it will be claimed to injure some one's first class business, if not the Erie's; and then will come the trouble. Multiplication of classes as a method of increasing business seems to be of very doubtful value in this country (except under the peculiar conditions of the trancontinental lines west of the Missouri River) and it is not likely that this move of the Erie will cause any earthquake. It is about two years since the trunk lines formally agreed not to run second-class sleepers, and the lack of noise on the subject since then indicates that it is not a burning question. Changes in the sleeping car business, like those in ordinary passenger business, will probably tend upward rather than downward. The spirit of progress is so constantly seeking fields for exercise that the disposition to regard existing standards as normal and to develop along present lines is all the time overborne by the movement to make better cars and faster speeds the "standard," and thus relegate the old standard to second place. There are good opportunities to do this in sleeping car accommodations as well as in other branches of passenger transportation, but they have not yet received the attention they deserve. Americans dislike the name second class, even when they would not object to the thing itself, so that the present sleeping cars could probably be made more profitable by reducing prices if the possible coincident reduction in quality of service were concealed with skill. This can be done, though of course passengers who are willing to pay higher prices must not be left without an "upper" class.

The most important step by the Master Car Builders' Association for a long time was taken this week at the meeting of the Executive Committee at Buffalo. It is the selection of a standard gauge for the M. C. B. vertical plane coupler. There has been much controversy over the form of this gauge, which is intended not for worn couplers, but for new ones. Several forms have been presented, but the following, which was proposed by the Secretary of the Association, has been selected: The gauge consists of two parts—one a minimum and maximum gauge for the thickness of the knuckle, together in a single cast iron frame, and one a gauge for the entire contour of the knuckle and head in another single cast iron frame. The gauge for the knuckle is simple in form and has no movable parts. The gauge for the contour is made to fit against the end and face of the knuckle, and has movable points which can be screwed out to the maximum and in to the minimum dimension by means of a milled nut. The allowances for variation in manufacture are the same as on the gauge proposed at the convention, with the exception of the thickness of the knuckle. At this point the allowance is $\frac{1}{2}$ in., instead of , as formerly proposed. These allowances are $\frac{1}{16}$ in. variation in throat of coupler head at centre line; , in. variation in the guard arm. There is on this new gauge an additional measurement at the heel of the knuckle, which was not on the gauge proposed at the convention. The allowance at this point is $\frac{7}{16}$ in. the same as for the guard arm. The method of using this gauge is as follows: The points are moved out one at a time to the maximum position, and the coupler is examined for the maximum and minimum positions of each point. The gauge is an ingenious one, and probably will be satisfactory. There will, of course, be a minority who will still wish to build to their own contour. These will not be satisfied with the variations allowed, but even this minority cannot but be satisfied with the design of the gauge. The drawings we shall give next week.

Locomotives for Suburban Traffic.

On another page we describe the new suburban engine built for the New York Central by the Schenectady Locomotive Works. In some respects this is a new design, having a six-wheel truck in the rear and a two-wheel truck in front, with a tank extending under the cab. One admirable feature about this engine is that the line of sight from the eye of the engineer to the roadbed is not interfered with by tanks or other projections on the sides of the engine, as the case is with some recent suburban engines.

The problem of a satisfactory suburban engine is a difficult one, and it is supposed to have been solved in many different ways, but it is safe to say that the best possible design has not yet been produced, while some miserable ones certainly have been tried. In order to understand the difficulty incident to the designing of a satisfactory suburban engine, it is necessary to have a clear conception of the conditions to be met.

A suburban train must be started quickly. This requires that the wheels of the locomotive be of small diameter, and that there be considerable weight on the drivers; also that the weight of the engine not available for adhesion be as little as possible. Again, when a suburban engine reaches a speed of 35 and 40 miles an hour, as they all do between stations, the number of revolutions per minute is greater than some of the fastest express engines at 60 and 65 miles per hour. Hence, there must be as much provision made for reducing wire drawing and compression on suburban engines as on those for high speed express service.

Except in the last requirement, a tank switcher without trucks approaches the ideal suburban engine. The entire weight is on the drivers, the wheels are small and there is a large starting power; but such an engine is rarely a good steamer at high speeds owing to the lack of firebox and grate area. It does not ride steadily, and the tank on the top of the boiler or on the sides interferes with the line of sight, and the engineer can only with great difficulty reach a hot crank pin, guide bar or piston rod. With the tank above the boiler, such engines are top heavy. Probably the objection most commonly made against such a design is that having no trucks there is danger of derailment, due to sharp flanges on the drivers caused by the reliance upon them for guiding the engine. To prevent this, and to make the engine ride more steadily, two wheel radial trucks have been introduced at each end, and such an engine forms one type of suburban locomotive which is favored by a few. The

latest form of this type is used on the Suburban Rapid Transit Railroad in New York.

Some engines recently built by the Brooks Locomotive Works for the Chicago & Northern Pacific suburban service are of this last mentioned general type except that they have four wheel trucks at each end, the front truck being placed exactly as on the ordinary eight-wheel engine. There are side tanks extending a considerable distance back of the head of the boiler in the cab, and a coal bunker in the rear. Probably these engines have more dead weight for an equal weight on drivers than any other suburban engine on record; there are 56,000 lbs. on the drivers and 44,000 lbs. on the trucks. In this engine the line of sight is not preserved. The engineer cannot see the motion work or reach it while the engine is running unless he is a gymnast. The engineer's position in the cab is peculiar, and the space where he stands on a wooden platform is extremely limited.

The New York Central engine has considerable weight on the two trucks, but has less dead weight in proportion to the weight on drivers than the engine for the Chicago & Northern Pacific. The simplest if not the most desirable solution of the problem is that obtained by the C. B. & Q. in its class "I" engines. That design, which was illustrated in the *Railroad Gazette*, Dec. 13, 1889, p. 816, has six drivers and the same hauling capacity as the New York Central suburban engines, but it has only two truck wheels instead of eight. It is, in point of fact, the class "H" engine, a mogul, with the boiler reversed in the frames, the frames slightly extended, and a tank placed there. It has less dead weight in proportion to the adhesive weight than any other suburban engine which we have knowledge of that has a guiding truck at one end.

On elevated roads the problem of hauling suburban trains is presented in its most aggravated form. In addition to all of the other requirements incidental to suburban traffic generally, there is the additional one of a minimum weight. The most modern structures for elevated roads are made strong enough to carry any reasonable concentration of loading per driving wheel, being built, as they are, of plate girders and laid with heavy rails. The dangerous stresses which the structure has to withstand are those produced in the top and bottom chord near the centre of the girders by the weight of the engine as a whole. Hence, while it is possible to use almost any weight per wheel that would be admissible on any surface road, yet it is necessary to keep the total weight of the engine as small as possible. Now, as there never is an excess of hauling capacity with elevated engines, there is always the need of placing all weight possible upon the drivers. With a limited total weight this requirement necessarily prevents the use of superfluous truck wheels, and therefore it is but a natural result that we find to-day trucks only under one end of the engines on the elevated roads in New York City and Brooklyn, with the exception of those on the Suburban Rapid Transit, which are hardly exceptions, as the sum of the weights on the two trucks at the front and rear is about equal to that on the single four-wheel truck of the Manhattan engines.

It is also to be noticed that the Chicago elevated road, after having analyzed all the modern designs of suburban engines, and having a more substantial structure than that used in New York City, has finally decided on a four-driver engine with trucks only at one end. In that case, as for the Illinois Central suburban service, and numerous other cases which we might mention, there were the strong arguments offered by the trackmen and civil engineers against the use of an engine without guiding trucks at both ends. Railroad men in this country do, as a rule, favor the guiding truck, and object to running the drivers ahead; but on what ground of actual result it is not easy to see. The necessity for it is not proved either abroad where trucks are the exception, in this country on elevated roads where the curves are 90-ft. radius, on the surface roads where Forney engines are common, or in the case of the latest example of this kind where the C. B. & Q. is running the class "I" engine, having six drivers and a two wheel truck in the rear, on fast suburban trains and over a comparatively crooked track. No detrimental effect, either on the tires or the rails has been found with these engines in continued service; hence, it is questionable whether there is a good ground for the objection to suburban engines without a leading truck at one end.

These remarks have been called out by the wide variation noticeable in designs of suburban engines made by some of our most prominent mechanical engineers during the last few years. These designs vary from engines with six drivers and two truck wheels, with a clear line of sight and tank under the cab, as approaching perhaps nearest to the ideal design, through all manner of combinations to engines with four drivers and eight truck wheels with tanks obstructing the line of sight, this last design being probably the farthest away from the most desirable type.

Elevated Terminals in Chicago.

It is probable that the time is not far distant when the railroads entering Chicago will be compelled to elevate their tracks above the level of the street. This may not mean necessarily that the streets will not be depressed, but as the discussion of the matter proceeds it looks probable that a separation of the grades for the entire difference in level will be finally obtained by elevating the railroads and leaving the streets where they are. Those who are not familiar with the feeling in Chicago can hardly appreciate how near this movement is at hand. One railroad has already offered to raise its tracks one-half the distance required for clearance provided the city will depress its streets the other half. This the city will refuse to do, if the present feeling is indicative of the result. It is but natural to suppose that the cheaper plan will be followed, and that certainly is the elevation of the tracks, leaving the streets as they now are. Outside the damages to adjoining property which would be claimed were the streets depressed, the cost is calculated to be greater to depress the streets and provide for drainage than to raise the roadbeds. Whatever may have been the feeling a few years since, before the people had any considerable knowledge of what it meant to elevate the tracks, counts for but little now that they are better informed. The construction of the elevated road has been an object lesson. Its simple form and comparatively inexpensive design have impressed the public favorably, and it will be difficult to get appropriations for lowering the streets or sharing in the cost of elevating tracks for railroads having such valuable franchises as those entering Chicago.

The treatment of the suburban traffic by some of the roads has prejudiced the public against the railroad companies, and they are not inclined to give them a bonus for a project which shall benefit so largely the railroads themselves. It will not soon be forgotten that when the ordinance was passed requiring the railroads to build fences along their right of way and to establish protecting gates at intersecting streets, or as an alternative to run trains at the speed of six miles per hour, the railroads were not very complaisant, and caused great annoyance to suburban passengers (Chicago is very largely suburban) by running trains at ridiculously low speeds rather than to put up fences and gates to meet the ordinance. When the fences were put up finally, several useful streets were closed at the railroad crossings, to the annoyance of people and merchants at these points.

It is such acts as these, coupled with the well known squabble with the Illinois Central, which have made the Chicago people determined, sooner or later, to compel the railroad companies to elevate the tracks at their own expense. Of course, it may be that they cannot compel the roads to do this, but it is evident that they intend to try. Whatever may be in the end the relative positions of the tracks and roadways when this change is made, there is one thing certain: The convenience of the public in the city and the appearance of the streets all demand the tracks to be raised without depressing the streets. The traveling public will hardly be affected differently whichever scheme is followed. As for their convenience and the saving of time, it is only necessary that the trains be run through at a good speed without stopping, from the outskirts to the heart of the city. In the matter of freight handling it will hardly be different to the railroad companies whether they elevate their tracks the whole distance or only half the distance, as in either case hydraulic power or some other modern scheme must be adopted for handling goods. There is no question but the railroads are occupying more miles of track for storing freight in the vicinity of the city warehouses than there would be any need of occupying if the facilities for handling freight were anything near what they should be, or were as good as those used in European countries.

The Argentine Situation.

The Argentine Minister of Finance has submitted the budget for 1892. In brief, it shows estimated receipts in gold, and in currency reduced to its actual gold value, of $50,740,000, as against expenditures of $44,640,000, leaving an apparent surplus of $6,100,000. Among the expenditures are included the cancellation of $15,000,000 paper money, but very little provision is made for the interest on the public debt.

The customs duties, however, being pledged for the foreign debt, a plan has been proposed which is certainly novel, and will result in a very material saving to Argentine, while it should encourage her foreign creditors. This plan is to establish in London an institution to be known as the Foreign Customs Bank, which shall distribute to the various Argentine consuls in Europe "customs stamps," which are to be sold to the shipping firms to the amount of the duties upon their respective shipments. In this way the duties will be paid at the port of shipment, in stead of the port of entry, the consuls will turn over the monies to the Foreign Customs Bank, which will disburse it to the creditors in accordance with instructions from the Minister of Finance, while the Argentine Government will be saved the difficulty and cost incident to a transfer of large sums of money from South America to Europe. Incidentally it may be remarked that the treasury will furthermore gain what would have been misappropriated or otherwise lost through the corruption of officials. The use of stamps will practically remove the opportunity for such knavery.

One effect of the hard times in the Argentine is evidently to set the people to work and to repress their over-indulgence in trivial luxuries. For many years the imports have exceeded the exports, sometimes by as much as $25,000,000, or even more. In 1890 the balance was still the wrong way, but the imports had fallen off 14 per cent. over those for 1889, while the exports had increased 40 per cent. That is an immense gain for one year. The Minister of Finance predicts that the result will be a balance in Argentine's favor of nearly $100,000,000 by the end of 1892, on account of increased production. This is in keeping with the too sanguine Argentine nature. The average increase in production during the past decade in the republic has been nearly 4 per cent. per annum.

Reports from the agricultural districts indicate increased endeavors along the old lines. The discouragments to the wheat growers, consequent upon the serious rains two years ago, have not proved lasting. The sheep *estancias* are being enlarged. Men who had abandoned their ancestral plantations for the more brilliant chances of the town are turning their attention once more to "the gold which grows at the end of the hoe." But we cannot expect a trade balance in favor of Argentine as soon as the Minister of Finance would have us believe. Indeed we would rather expect an increase in 1891 of about 10 per cent. over the exports of 1889. It is then possible that there may be a greater gain in 1892, but there will almost as certainly be an increase of imports. Even should the figures approach near each other, we regard it as unlikely that the spirit of luxury inculcated in the Argentines during the past decade will for many years suffer that prosperous condition, which so effectually turned their heads, when the annual trade balance was $13,000,000 in their favor, to return again. For another generation capital will not flow into Argentine as it did from 1880 to 1890. They must in the mean time work out their own destinies, and in the end through a renewal of emigration, at a more normal rate, we may see the respective currents of national trade assume the relative proportions hoped for by the Minister of Finance

For weeks we have all been congratulating ourselves on the big crops and good prices. Now the roads east of Chicago are beginning to feel the effects of the favorable conditions, and a large export traffic during the winter seems reasonably certain. It is another cause for congratulation that Germany and Denmark have agreed to raise the embargo on American pork. It will be remembered that Bismarck under pretense of preserving the German health, forbade the importation of American pork, alleging that it was diseased. This was a mere pretext, but it served the purpose of putting an end to the competition of American hog products with German. The removal of this embargo will be a distinct advantage to the manufacturing classes in Germany by giving them cheaper food. While under this embargo American slaughterers did not conform their products to the requirements of the German markets, and so for the present the sales abroad will not be greatly affected. But in the future, when markets are known to be open to our pork, and things adjust themselves to the new conditions this action of Germany will be of great benefit to American packers and to the railroads which carry their products. The *Stockholder* (New York) publishes the following figures of our exports of hog products to France and Germany before and after the embargo was laid upon them:

	France. Lbs.	Germany, Lbs.
1876-77	23,347,000	21,966,000
1877-78	58,880,000	28,726,000
1878-79	55,732,000	38,429,000
1879-80	67,906,000	28,103,000
1880-81	70,003,000	43,005,000
1885-86	172,624	2,656,628
1886-87	183,716	3,000,339
1887-88	104,339	2,190,229
1888-89	81,287	1,395,397
1889-90	334,500	3,363,386

The Chicago & Alton has been experimenting with a device on a locomotive for superheating the air supplied to the fire before it reaches the grate. The attachments are so constructed as not to interfere with the working of the engine in the ordinary manner, should anything happen to disable the appliances being experimented with. To change the engine back to the common form, it is only necessary to open the front end and put the tip on the front nozzle. For these experiments, changes

have been made in the smoke stack and cylinder saddle, and the nozzles have been removed and the exhaust pipe is made 5½ in. in diameter, straight opening. Around the stack is placed a perforated casing in which is a coil of 2-in. brass pipe through which the water from the injector passes into the boiler. Air enters the perforations in the shell around the stack, passes into a revolving fan, and is by it driven into a pipe extending back under the trucks into the ash pan. Thus the air reaches the grate after passing around the smoke stack. Branch pipes from the main air pipe run up the four corners of the fire box through which the air is forced directly into the furnace above the burning fuel with the expectation of completing the ignition of the gases. The fan is driven by a small rotary engine connected by friction clutches. The engine and fan are placed in the forward half of the front end of the smoke box, and an air tight plate is placed between this compartment and the smoke box proper. This rotary engine also drives a dynamo placed on the bumper for running the electric lights in the head light. Light is also furnished for the illuminated signal and for cab and tender lights. The head light is placed in the center line of the boiler in the position of the ordinary number plate. It is a 75 candle power lamp. The operations of the fan and dynamo are controlled by levers from the cab, the steam supply being taken for the rotary engine through the hand rail, from the combination stand in the cab. The engine, while having a considerable amount of apparatus, presents a neat appearance, and the casing around the stack is not unsightly. This has been a scheme which has been a favorite with inventors for years past. With the exception of the electric feature, it has been tried before and found wanting.

It is rumored that the Chicago Real Estate Board will take some decided action soon to obtain the passage of an ordinance limiting the height of buildings in Chicago. They do this because they believe that the real estate in the centre of the city will be seriously damaged by the presence of tall buildings. As it is now, buildings of importance are shaded by the tall ones and light is obstructed. In fact, such structures have already become a nuisance to the occupants of surrounding buildings. Others take the ground that in case of an earthquake there is danger to surrounding property. If an ordinance cannot be obtained because of damage to surrounding property, there will be an attempt made to get it because of the high lift of the elevators and the consequent danger. Some building constructors are emphatic in their statements that, in case of a minor earthquake, which would not do damage to ordinary buildings, the entire facing of the taller ones, which is held to the steel structure within, would fall off and crush the roofs of surrounding buildings. Probably the result of an application for such an ordinance would be the appointment of a board of engineers, whose report would be extremely interesting.

In another column will be found an announcement that the first Fall meeting of the Western Railway Club will take place next Tuesday, and that Mr. Godfrey W. Rhodes will open the meeting by a discussion of the "Rules Governing Air Brake Practice" as presented to the M. C. B. Association this year. All who have read Mr. Rhode's speech at the convention will remember the importance of it, and that as a result the rules were not adopted, but referred to a committee to be carefully tried for one year or more before adoption. At this coming meeting there will be many valuable points brought out, and a good discussion will be sure to follow, as there has been an endeavor made to have all of the brake instructors in the vicinity of Chicago present at the meeting. This promises to be the liveliest and most important year of the club's existance. Speakers for the entire season have been secured and the subjects will be announced soon. The record of this club last year will be found hard to beat, but probably it can be done by concerted action on the part of the members.

The entire capital stock of the Railway Age Publishing Company, amounting to $75,000, has been sold to Mr. Harry P. Robinson, of St. Paul, Minn. That enterprising and lively sheet, the *Northwestern Railroader*, now controlled by Mr. Robinson, will be consolidated with the *Railway Age* on Sept. 15. A new company has been formed for the publication of the consolidated journal at Chicago. Mr. Robinson will be President and Manager of the new company, and Mr. H. R. Hobart, who has been for many years one of the editors of the *Railway Age*, is Vice-President. We certainly wish for the *Northwestern Railroader and Railway Age* the success which the experience and ability of its owners and managers deserve, and our only regret is that it is handicapped by such a cumbersome name. It is announced that the journal will have offices both in Chicago and St. Paul. Mr. E. H. Talbott, President and Editor of the *Railway Age*, retires entirely from the new concern.

Everything must have a name, of course; and the Central Traffic Association roads, in making half-fare rates from west of the Mississippi, have had to use the term "Home Visitors' Excursion." As long as the Star of Empire persists in traveling in its time-honored direction, "Home Seekers' Excursion" will not apply, and if the Westerners should come East on a "Harvest" excursion they would have to bring the harvest with them, else their remarks about the littleness of things in the East would be intolerable; so the roads are excusable for employing a name somewhat lacking in the poetic element. An excursion for Goers Away in General will probably be the next new scheme.

The Steamship City of New York, which carried the Japan mails that the Canadian Pacific and New York Central delivered in New York in 84 hours from Vancouver (as noted last week) reached Queenstown at 2 P. M., Sept. 8, having crossed the Atlantic in 5 days, 22 hours and 50 minutes. The City of New York on this trip beat all previous eastward ocean records, and delivered mails at Queenstown in less than 20 days, actual time, from Yokohoma. In consequence of blunders and inadequate arrangements, the time from Queenstown to London was not brilliant, mails having been carried to Liverpool that should have been put off at Queenstown.

The Rapid Transit Commissioners of Boston have followed the good example of those of New York, and appointed an advisory board of consulting engineers to act with their Chief Engineer, Mr. George S. Rice, in the examination and study of the rapid transit problem of that city and suburbs. The advisory board consists of Mr. Theodore Cooper, of New York; Mr. A. Fteley, of New York, and Mr. F. P. Stearns, of Boston.

NEW PUBLICATIONS.

Geological Survey of New Jersey. Annual report of the State Geologist for the year 1890.

The Geological Survey of New Jersey was begun by Prof. George H. Cook in 1863. The law authorizing the survey, constituted a Board of Managers consisting of two members from each of the several Congressional Districts of the state with the Governor as *ex officio* Governor of the Board. The annual reports of the State Geologist are printed as part of the legislative documents of the state, and are distributed among their constituents by the members of the Legislature, and still other copies are supplied to the Board of Managers and the State Geologist, to distribute to libraries and public institutions and persons interested in the subjects of which they treat.

The reports of Prof. Cook, from 1864 until his death, Sept. 22, 1889, were model official documents. Every one of them contained some special report on a matter of interest to a large class of the community. The consequence was that public interest was aroused and maintained in the State Survey, and appropriations were obtained without difficulty for the continuance of a work which bore such good results and was presented to the public in such attractive form. The topography of the state and the economic geology were so thoroughly given in these reports that they have been in great demand, and many of them are entirely out of print, greatly to the regret of hundreds and probably thousands of persons who are interested in their contents.

On Oct. 1, 1890, Prof. John C. Smock, who had been connected with the survey for many years, was appointed State Geologist, and the present report bears witness to the fitness of the appointment. It is a volume of 305 pages, including a very full index of the matters referred to in the text of the report, but is unfortunately deficient in that there is no table of contents, nor is there any running title at the head of the pages indicating the subject or the author of the various reports of which the volume is composed.

These reports are as follows:

(1) An introduction and summary of the work done during the year, by Prof. Smock.

(2) Memorandum by Mr. E. A. Bowser, in charge of the U. S. Geodetic Survey, stating that no work has been done during the present season, and explaining the advantages which would accrue from an appropriation from the United States Government of $16,000.

(3) A valuable monogram on the white limestones of Sussex County, by Frank L. Nason.

(4) Frank L. Nason next describes all of the iron mines in the state which are now worked, and discusses the probability of other great deposits of iron, and the method of determining their position. A list is given of all the iron mines which have ever been worked in New Jersey, and their location is shown on a map.

(5) C. W. Coman describes the progress made in the investigation of the terrace formations of the Atlantic coast and along the Delaware River.

(6) The most important paper in the report is that which covers about 150 pages, and is by Mr. C. C. Vermeule. It is on the "Water Supply and Water Power Resources of New Jersey." There is perhaps a little too much theorizing in this paper on rather insufficient data with reference to the computation of the probable yield of streams at different seasons of the year, but there is also an enormous amount of practical and useful information derived from actual observation.

The engineer in charge of the work has gone about it in a systematic manner, and has been fortunate enough to secure the co-operation of a number of observers, and thus procure continuous gauging of a number of streams in the state to an extent sufficient to form a pretty good idea of the distribution of the flow in connection with the records of rainfall. The interest which the publication of this report will create will undoubtedly result in enabling the director of the survey to procure fuller data in the future. The reference to the water power available in the state is quite complete, and shows that there is in use water power to the extent of 23,000 H. P., and that there are a number of excellent sites not yet utilized.

(7) The artesian and other bored wells in the state are described by Mr. Vermeule and Mr. Lewis Woolman.

(8) The last of the special reports is by Mr. George W. Howell, and relates to the progress made in the drainage of the Passaic River. The general charge of the office is in the hands of Mr. Irving S. Upson, who was assistant-in-charge of the Survey during the period between the death of Prof. Cook and the appointment of Prof. Smock.

It is by comparison of such reports as this and the Massachusetts report, to which we have already called attention, that the disgraceful backwardness of the State of New York is made apparent. About all the State Engineer of New York has to report on, is the condition of "Clinton's Ditch," and the contracts which have been made for keeping it clean.

New York State Board of Health; Eleventh Annual Report, Feb. 20, 1891.

This report is in two volumes, comprising 935 pages, printed on miserable paper, is supplied with a good table of contents, but no index to subjects, and is illustrated with a number of maps which are generally very poorly reproduced. The general get up is not creditable to the State of New York. Its contents, however, are valuable and well arranged.

The State Board of Health consists of eight members, three of whom are appointed by the Governor and Senate, three are appointed by the Governor from the Health Commissioners of Cities, and two are *ex officio* members, being the Health Officer of New York and the Attorney-General of the State. The Secretary and executive officer is Dr. Lewis Balch.

The report of the Board occupies 26 pages, and is a brief general summary of the work done during the past year. This comprised the registration of vital statistics, the examination of eleven plans for the sewerage of villages, the making of rules for the sanitary protection of the water supply of three towns, the examination of the feasibility of a system of sewerage for one village, and the sewage disposal of another; examinations of several nuisances, and a partial inspection of the Hudson River to estimate the amount of pollution it receives from the cities and towns on its banks.

The plans for the sewerage of villages and towns are required by law to be submitted to and approved by the State Board of Health before they can be carried out.

The preliminary reports of the engineers who prepared the plans, copies of the plans themselves, and the reports made to the Board by the expert engineers employed by them are given in full.

The only criticism to be made on this part of the report is that the plans are drawn to all sorts of scales, by all sorts of draughtsmen, and are very badly engraved and printed. It would be just as easy, and a great deal more creditable, to have all such plans prepared on a uniform scale by competent draughtsmen.

It is a good plan to have the State Board of Health empowered to make rules for restraining the pollution of water supplies. It seems, however, somewhat questionable whether the state should be called upon to make preliminary investigations as to the feasibility of constructing sewers and disposing of sewage in a town before the town itself has done anything in that direction, unless the cost of the examination should be paid by the town, and not included in the expenses of the State Board of Health.

There is no civil engineer officially connected with the State Board, and each investigation of water supply and sewerage on which the Board is called upon to express an opinion is made by an engineer hired for the occasion. In 1890 some of the examinations were made by E. Kuichling, C. E., but most of them by C. C. Brown, C. E.

The report of the Secretary on the sanitary condition of the state, and the summary of mortality reported during the year appears to be very complete and well arranged. It is a capital mine for statisticians to work in, but can hardly be considered interesting reading for the general public.

Surveying and Leveling Instruments Theoretically and Practically Described for Construction, Qualities, etc., etc. By William Ford Stanley, Optician, Manufacturer of Surveying and Drawing Instruments. London and New York: E. & F. N. Spon, 1890, pp 552; index and price list; numerous illustrations. $3.00.

For a maker of instruments to get out a small octavo or 12mo volume of 550 pages, largely describing his own product, and offer it to the public for three dollars, sounds in the bald statement of the fact almost like presumption. But to the few people who want such a book as this, or are likely to buy it, it is worth the price. In the first place it is physically a well made book. The paper, typography, press work, binding and engraving are all good. It is a sound and pleasing little book to handle and look at. But it is a great deal more than that. It is the outgrowth of notes made for many years, of queries that came to Mr. Stanley "relative to the functional parts of surveying instruments." Finally the scheme of the book was elaborated. It is to treat first the philosophy and principles, and the materials and manipulation, that enter into the construction of the instruments; then to take a typical instrument of each class and describe it in

such detail as would enable a skilful workman to make it. Furthermore, tests for determining the quality of the workmanship and methods of adjustment are given for the professional man whose knowledge must be less than that of a manufacturer. The engravings are all made directly from the instruments or from working drawings. The descriptions of the instruments ordinarily used by the railroad, mining and city engineer are excellent, and carefully illustrated. To these are added descriptions of the reading microscope and micrometers; of the sextant and other reflecting instruments; of the transit theodolite as adapted to minor field astronomy; of larger theodolites for geodetic work, and in fact of many beautiful instruments and attachments which will delight the heart of any man who has been trained in high class instrumental work. In short, the volume contains so much information, and is so free from misinformation and padding that the price is quite justified; even if one is not prepared to go so far as to say that the price of books should be inversely as their bulk.

THE SCRAP HEAP.

Notes.

There is no foundation for the report that the Wabash will run chair cars on other than through trains.

An express train ran into a freight train near Medina del Campo, on the Northern Railroad of Spain, on Sept. 3. Eight carriages were wrecked, seven persons killed and 20 injured.

The car shops of the Grand Trunk at Port Huron, Mich., were partially destroyed by fire on Sunday night last. Loss, $75,000. The Youngstown Bridge Works, at Youngstown, O., were burned Sept. 4. Loss, $75,000; insurance, $60,000. The company will rebuild at once.

The Missouri, Kansas & Texas has discharged 32 men from the shops at Sedalia, Mo., and 100 at Denison, Tex. The Central of New Jersey has discharged 70 painters from the car shops at Elizabethport. Two hundred men have been discharged from the Pullman shops at Wilmington, Del.

A passenger train was stopped by highwaymen near Modesto, Cal., on the evening of Sept. 4, but the robbers were beaten off after a fight lasting some time and in which firearms were used on both sides. A detective who happened to be on the train and who joined in the fight, was fatally shot.

Following is the schedule of wages adopted on the Missouri, Kansas & Texas since the recent negotiations with the employés' organization: Conductors, $125 per month; baggagemen, $65; brakemen, $55, and porters, $40. On special passenger trains, per mile, conductors, 2½ cents; brakemen, 1.1 cents, and porters, ¼ cent. Conductors on through freight trains 3 cents, and brakemen 2 cents per mile. Day yardmaster, $110 per month; night, $100; day foreman, $2.70 per day; night, $2.75; day switchmen, $70; night, $75 per month.

Foreign Notes.

The city of Breslau, in Germany, is shortly to have an electric street railroad. It is to be eight miles long and the preliminary operations are now being vigorously prosecuted.

Belgium has invited the various other states to attend an international conference to be opened at Brussels on Oct. 10, with the view of determining upon a uniform system of baggage regulations for railroads. Germany, England, France, Italy, Russia, Spain, Denmark, Norway and Sweden, Switzerland and Roumania have already officially accepted the invitation.

In accordance with a government regulation which went into effect in Belgium on June 20, freight trains will no longer be dispatched in that country on Sundays and holidays. The ruling was designed in the interest of railroad employés. Up to Oct. 20 it is to be followed only at the discretion of the railroad authorities, with the view of making the innovation gradual in character. After that date, it would appear, a more rigid adherence to it is expected.

The Swiss Federal Council has addressed a circular letter to the different railroad companies of Switzerland in which attention is drawn to the importance of properly lighting railroad stations. Prominence has been given to this matter by several recent fatal accidents to railroad employés, attributable, it is stated, to poor station lighting arrangements. It is, therefore, pointed out by the government authorities, that at all stations where the adjoining town or city is lighted by gas or electricity the same means of illumination should be employed. The item of greater cost of such improved systems of lighting would, in such cases, it is maintained, be comparatively trifling; at any rate it would be comparatively overshadowed by the advantage of increased safety in traffic management.

As examples worthy of imitation the *Verkehrszeitung* cites the training schools which have been instituted by Italian railroads for machine shop apprentices. One such school is connected with every large railroad shop, and serves the purpose of giving the necessary preliminary instruction to young men who intend to become railroad machinists. The schools are under the supervision of the respective master mechanics of the different roads. Tuition is free; the age of applicants for admission must not be over sixteen years. The hours of study are limited to two per day, the term of study extending from Nov. 1 to July 1. The remaining four months of each year are devoted wholly to practical work in the shops. Prizes of moderate sums of money are annually awarded to those scholars who have specially distinguished themselves in their studies. There are annual examinations, rigidly conducted, and graduates receive diplomas.

New Stations and Shops.

The new shops of the Toledo, Columbus & Cincinnati, at Kenton, O., have been completed, and are now running.

The Pittsburgh & Lake Erie is erecting new stations at Chartiers, Shousetown and Shannopin, Pa. The company is also building, at Chartiers, an erecting shop 105 × 145 ft., and a boiler shop 30 × 100 ft.

The Wagner Palace Car Co. is putting in an electric transfer table at its East Buffalo (N. Y.), shops.

The Carolina Midland will build repair shops at Blackville, S. C.

The Adams Express Co. will build a three or four story building where the present freight house is situated at Eleventh street and Liberty avenue, Pittsburg, Pa.

A power house is to be built for the cable line of the Washington & Georgetown Railroad in Washington, D. C., to cost $300,000. Pennock Bros., of Philadelphia, put in a bid of $299,787, and will probably be awarded the contract. The contract calls for the completion of the building by August, 1892.

Postal Cars on a Street Railroad.

Postmaster J. B. Harlow, of St. Louis, Mo., has made a scheme for facilitating the transmission of mails between the various sections of that city and the main post office by using the street railroad lines, and the experiment will probably be tried within a few weeks, the contract being now in Washington for approval. The plan is described as follows:

As operated at present 62 square miles of the city is supplied with five sub-stations—about 10 square miles per station. Much valuable time is lost by carriers in going to and from stations, which could be utilized if they could get their mail at points less remote from their routes. It is therefore proposed to establish sub-stations, with facilities for stamp sales, registry, etc., to the number of about 60, mostly in drug stores and similar places, contiguous to certain street car lines which radiate north, northwest, west, southwest and south; placing on the selected lines cars quite similar to ordinary railroad post offices. In these cars will be carried a messenger. He will receive the mails as arranged at the central post office. At the first of his stations he will pass off the sack for that station, receiving at the same time the mail accumulated there. This will have been already partly arranged, so that the package for station 2 will come to him marked with a red tag and he can go on with his distribution for stations beyond; and so at each succeeding delivery and reception of mail over his entire route. The main idea is to do away, as far as possible, with carrying all collections to the general office for assortment and distribution. It is intended to begin with two cars. To further popularize the cars, the car next preceding a mail train will carry a signal to denote such to be the case. The mail cars are evidently to be hauled with regular passenger cars, and each postal train will carry a flag on the motor car, lettered "St. Louis R. R. P. O." There is already a very satisfactory express business done over a street car line to the southern part of the city.

Infected Cars.

Attention is directed in the *Moniteur Industriel*, to the researches of M. Cornet which have shown that places inhabited by sufferers from phthisis frequently contain germs of that disease. Pushing these experiments still further, M. Pransnitz has examined a number of railroad cars much used by consumptives. Dust samples were taken from these cars and inoculation experiments were made with them on different animals. Two out of five such samples were found to contain tuberculosis bacilli and a number of the inoculated animals showed symptons of the disease. After periods of from 10 to 12 weeks after inoculation, the animals were killed for further examination, and it was then found that in every case the disease had made but slow progress, this circumstance apparently showing that the number of bacilli present in the dust was comparatively small. Nevertheless, M. Pransnitz has thought it well to commend to the attention of railroad authorities the eminent desirability of careful cleaning and disinfecting railroad cars which may have been exposed to infection. Steam disinfection is recommended as both efficient and easily applied. The adoption of certain other sanitary measures, such as the introduction of easily sterilized receptacles for the sputa of patients is also suggested.

The Whaleback Boom.

It is now said that the American Steel Barge Co. will double the capacity of its plant at Superior, Wis., the coming winter, and will expect to launch about 50,000 tons by the middle of next summer.

Street Car Tickets Ordered Two Years in Advance.

The Latin-American Department of the World's Columbian Exposition learns that a great number of people from Mexico will visit the United States in 1893. "Personally conducted tours are being arranged and the lists are being rapidly filled. Senor Spindola will conduct a number of excursions from Mexico to Chicago and return. The cost to each subscriber will be $200, and will include all the necessary expenses of the trip, viz: fare to and from Chicago, Pullman cars, meals en route, ten days hotel in Chicago, ten admissions to the Exposition, and street railroad tickets covering the entire period of the stay in Chicago. Excursions are proposed by sea to New York and San Francisco, and thence to Chicago by rail. Each party will be accompanied by competent interpreters." Porters' and waiters' fees will make a trifling addition to the expense, but if the people who are "rapidly filling up the lists" are as fore-handed as they seem to be, they will at once put the $200 at interest, and thus partially avert the calamity that is liable to result if they start out in 1893 under the delusion that the inevitable expenses are all paid.

The Railroads of Canada.

Canada's first railroad was the Champlain & St. Lawrence line, about 15 miles in length, connecting Laprairie and St. John's, Quebec. The charter for its construction was obtained in 1832, and it was first opened for traffic on July 23, 1836, by Lord Gosford. A return of its operations for 1842 shows that in that year it carried 27,041 passengers and 7,716 tons of freight, and that its earnings were $13,650 and its operating expenses $10,744. The progress of the country in the half century that has since elapsed is strikingly shown by the railroad statistics recently submitted to Parliament. In the year ending June 30, 1890, there were 13,256 miles of road in operation, the number of passengers carried was 12,821,262, and tons of freight, 20,787,409. The gross earnings were $46,843,826, and the operating expenses, $32,913,350. The return shows that the number of miles of completed railroad in Canada is 14,004, and of sidings, 1,679.

The paid-up capital of the various systems aggregates $786,447,811, or $56,174 per mile. From first to last the governments of the country have granted aid in the shape of loans, bonuses and subscriptions to shares or bonds of railroad companies as follows: Dominion Government, $145,445,323; Ontario, $6,097,007; Quebec, $13,177,453; New Brunswick, $4,517,347; Nova Scotia, $2,135,996; Manitoba, $2,478,300, and British Columbia, $37,500. A total of $173,888,926.

In addition to this the various governments have granted about 32,750,000 acres of land to railroads, not including the grant to the Winnipeg & Hudson Bay road. Municipal aid has been given by way of bonus to the amount of $10,594,915, in loans, $2,992,000, and in subscriptions to shares or bonds, $2,245,500. The greater portion of the Canadian railroad system is now either owned or controlled by two companies, the Grand Trunk and the Canadian Pacific. The former operates 3,122 miles, and the latter 5,085 miles. The four government lines aggregate 1,352 miles.

A High Novelty.

Open street cars, of the pattern so well known in this country, with a number of transverse seats, and longitudinal foot-boards along the two sides, are being used experimentally by one of the Berlin street railroad companies, and German papers are referring to them as noteworthy novelties.

The Trans-Siberian Railroad.

We give the following press dispatches for what they are worth:

LONDON, Sept. 8.—A party of American engineers, who are reported to be agents of a firm which proposes to make a tender for building the Siberian railroad, have arrived at Vladivostock to ascertain the conditions of the construction of the line.

ST. PETERSBURG, Sept. 8.—An American syndicate has taken the contract to build the great Siberian railroad, and an American engineer has just arrived at Vladikavkas to inspect the route.

Railroads in Costa Rica.

A contract has been ratified between the Government of Costa Rica and a syndicate for the construction of a railroad from San Jose to Puenta Arenes, the principal Pacific port. This road when built will be likely to affect the Panama Railroad, as there is already a railroad from Port Lima, the Atlantic port of Costa Rica to San Jose, the capital, and the completion of this line to Puenta Arenes will give through railroad transportation from the Atlantic to the Pacific. The Government guarantees a minimum profit of five per cent. annually for 25 years on the total cost of the road, which is estimated at $4,000,000.

The Oyster Bay Line to Boston.

The steamer "Cape Charles," formerly used between Norfolk and Cape Charles City, Va., as a transfer boat, is now owned by the New England Terminal Co. It has been extensively repaired and will be employed as a transfer boat for freight and passengers between Oyster Bay, L. I., and Wilson's Point, Conn., for the new line between Brooklyn and Boston over the Long Island, Housatonic and New York & New England railroads. It is said that the new line will be opened on Sept. 21. The Cape Charles is expected to be able to make the Wilson's Point transfer in 50 minutes.

Argentine Railroads.

An official report of the condition of railroads in the Argentine Province of Santa Fe has been received by the Bureau of American Republics. In 1888 there were 360 miles in operation in the province. This number had increased in 1889 to 418, and in 1890 to 503, while 193 miles was in process of construction. A direct line is building from Santa Fe to Rosario, which will probably be open to traffic before the end of the year. The returns in 1889 amounted to $902,222, and the expenses to $1,027,856, as compared with returns of $2,034,772 in 1890, and expenses of $1,602,958. The rates in 1890 were the same as in 1889, but since April, 1891, the depreciation of the paper dollar has compelled an increase of 110 per cent. in rates.

The Future of the "Whaleback."

The New York *Sun* called attention the other day to the fact that there were at the same time in the lower bay the Sandy Hook twin-screw steamer, "Monmouth" an old wooden side-wheel seagoing steamer; the phenomenally fast steamer, "Anna H. Norwood," and the whaleback steamer, "Wetmore," which, having returned from Liverpool, was starting to take a cargo of shipbuilding machinery to Puget's Sound.

The side-wheel wooden steamer is a fair type of the practice of 30 years ago, and the "Monmouth" is fully up to the best types of two years ago, but is modeled on European lines both as to its hull and machinery. The "Norwood," though it is two years old, is in reality a creation of this season, some $20,000 having been spent in improving her machinery and lines by Mr. Norman L. Munroe, her owner, since she was launched. Her success leads him to a hope that a larger boat can be built which will cross the Atlantic at the rate of 35 knots. The speed of the "Norwood" is due to the Mosher furnace, which, for an equal efficiency, is said to require but half the space of a Thorneycroft boiler.

The whaleback, unlike the Norwood, which is distinctively American in its boiler, is distinctively American in the lines of its hull; and as a freight carrier it claims to be the coming style of boat. The capitalists who are interested in this style of freight carrier have turned out 35,500 tons on this model during the past three years from their shipyard at Superior City, and are, as is known, proposing to go into the passenger traffic on the lakes for the World's Fair business. In addition to this they are starting a shipyard on some 8,000 acres of land they have purchased at the mouth of the Snohomish River, 30 miles north of Seattle, on Puget Sound, where they will, it is said, immediately commence building, first with imported materials, but later from the products of their own rolling mills and furnaces.

It has been claimed that these boats, although efficient on the comparatively still waters of the lakes, will not do for the ocean traffic, but there was nothing in the two voyages of the Wetmore across the North Atlantic to justify such an assertion, though it still remains to be proved that they can tow consorts on so rough a sea. That the owners consider the voyage to Liverpool and back a success, is demonstrated by their continuing their preparations for a shipyard on the Pacific coast.

LOCOMOTIVE BUILDING.

The Louisville & Nashville has placed an order for 10 consolidation engines.

The Lake Shore & Michigan Southern will probably order ten 10-wheel locomotives.

The Chesapeake & Ohio has ordered about 20 freight, passenger and switching engines.

The San Antonio & Aransas Pass has just received the last three of a lot of ten locomotives.

The Cincinnati, Hamilton & Dayton has placed an order for two 8-wheel and two 10-wheel engines.

The Baldwin Locomotive Works has received an order from the Lehigh Valley for 10 consolidation engines and ten 10-wheelers.

The Brooks Locomotive Works, of Dunkirk, N. Y., are building nine six-wheel switching engines with 18x24-inch cylinders for the Illinois Central.

The Marietta & North Georgia has received from the Baldwin Locomotive Works an engine weighing 64 tons with cylinders 20 × 24. It is designed to pull eight cars loaded with 200 tons up a four per cent. grade with 14 degree curves.

The Los Angeles Terminal has received two locomotives from the Baldwin Locomotive Works, and two more will shortly leave Philadelphia. One of the latter is a ten-wheel Vauclain compound, with cylinders 18 × 24. This will be the first of its kind to reach the Pacific Coast.

Mr. Johnstone, Superintendent of Motive Power and Machinery for the Mexican Central, has asked for bids for building three enormous compound engines. They are to have 12 drivers, articulated. The total weight of one of these engines will be 230,000 lbs., with 200,000 lbs. on the drivers.

The six ten-wheel compound locomotives, Johnstone's system, built at the Rhode Island Locomotive Works for the Mexican Central, have been shipped; the last one will probably reach Chicago early next week, and it is expected to make a trial run with it on the Wabash, and, later, on the Atchison.

CAR BUILDING.

The Lake Shore & Michigan Southern is asking bids for 25 passenger coaches, which are to be fitted with the Leland heater.

The Baltimore & Ohio has ordered 21 passenger cars from the Pullman Palace Car Co. for service on the Royal Blue Line.

The Wilmington, Onslow & East Carolina Railroad has purchased two first class passenger coaches from Reginald, Canning & Co., of New York City.

It has been stated that a contract for 30 coaches has been let by the Chicago & Eastern Illinois Railroad, but this is not true, as the contracts have not been made out or the bids closed. The company is in the market for 24 instead of 30 coaches.

The Illinois Central is building at the Macomb shops 100 coal cars of 60,000 lbs. capacity with swing trucks. These are regular standard gondolas. This company has just ordered from the Pullman Works 100 fruit cars, 35 ft. long and of 50,000 lbs. capacity; also 300 box cars of the Mount Vernon Car Co., Mount Vernon, Ill. These will be 35 ft. long and of 50,000 lbs. capacity; they will have rigid trucks but otherwise are the regular standard of this company.

The Chicago, Burlington & Quincy is in the market for 2,000 34-ft. box cars, 34 ft. long, and of 60,000 lbs. capacity. These cars are to have the low sills heretofore described in The *Railroad Gazette*, and the drawbars will pass through the end sills. Air brakes, M. C. B. vertical plane couplers, National hollow brake-beams, Christie brakeshoes and double board felt roofs are called for. These cars are the new standard of the C., B. & Q., and embody the latest designs in details for wooden cars.

BRIDGE BUILDING.

Baltimore, Md.—The city will build a new bridge across Jones' Falls at Lexington street, Baltimore.

Billings, Mont.—The Northern Pacific is constructing a new steel bridge over the Yellowstone River at Billings to replace a wooden Howe truss, which was built when the road was first constructed. The structure consists of three spans of 160 ft. each; the superstructure will rest upon granite piers and abutments. The company is also replacing much of its trestle work with stone culverts and earth embankments.

Bristol, Tenn.—The city will build an overhead bridge on Anderson street, in connection with the Bristol, Elizabethtown & North Carolina Railroad.

Buzzard's Ford, W. Va.—Work has been commenced on the new bridge over the river at Buzzard's Ford. One pier is completed, the abutments begun, and the superstructure is ready to be placed in position.

Chicago, Ill.—The American Bridge Works, of Chicago, has put in a bid of $118,220 for the superstructure of the Ogden avenue viaduct. This was the lowest of nine bids received, and it is understood will secure the contract.

Cumberland, Md.—The work of tearing down the Baltimore street bridge over the tracks of the Baltimore & Ohio, one span of which fell last week, killing two men, has been finished, and the work of erecting the new steel structure to replace it has been commenced. The new bridge will have a span of 250 ft., spanning the entire yard of the railroad company.

Denver, Col.—The sum of $100 is offered by the city for the best adapted plans and specifications coming within the limit of $14,000 for the construction of an iron truss bridge and its foundations at Denver, provided the plans are not furnished by the parties securing the contract for construction. Plans and specifications will be received to Sept. 20.

Galesburg, Ill.—The city is making arrangements to build several bridges over Cedar Fork.

Meriden, Conn.—The engineer has finished the plans for the masonry of the South Meriden bridge, and expects to complete the specifications soon. Bids will be asked for soon.

James Kane & Son have secured the contract for building a stone arch bridge on Broad street, the price being $7,080.

Montreal, P. Q.—It is reported that the city has concluded arrangements for the construction of a subway under the Canadian Pacific tracks at Ontario street. The estimated cost is $7,300. A bridge over the tracks will probably be built at St. Catharine street.

New Smyrna, Fla.—The New Smyrna Bridge & Investment Co. has been incorporated by A. J. McCreery, J. L. McCreery, R. S. Nelson, P. M. Bryan and B. A. Strange, to operate a toll-bridge across the Hillsboro River at this place.

North Yakima, Wash.—J. R. Peters, the contractor on the new railroad bridge over the Natchees River, has completed the work. The bridge cost the railroad company about $36,000.

Pawtucket, R. I.—A bridge will be built over the river at Blackstone avenue.

Piedmont, W. Va.—Plans have been prepared for a two-span highway bridge to connect Piedmont, W. Va. and Westernport, Md., spanning the Potomac River. The river at that point is about 400 ft. wide.

Springfield, O.—It is said that a truss bridge of 95 ft. span is to be built by the city, and that the City Council has already taken action that will secure the necessary funds.

Thomaston, Ga.—The County Commissioners of Upson County will build a bridge across the Cobb River.

Watkins Mill, Ga.—Bids will be received until Sept. 19, by H. T. Cooper, Douglasville, Ga., for the construction of a bridge across Dog River at this place.

Westmoreland County, N. B.—Tenders will be received up to Sept. 17 by the Commissioner of Public Works at Fredericton, N. B., for rebuilding the bridge at Holines Creek, Westmoreland County.

Wheeling, W. Va.—The Commissioners of Ohio County have plans made for seven new steel bridges to cross Wheeling Creek at various points along the National Road within ten miles of Wheeling. The spans will average 80 ft.

Last week the Wheeling Bridge Company opened for traffic its back river bridge, connecting Wheeling Island with Martin's Ferry and the Ohio mainland. The bridge is a substantial steel structure, with double roadway, built to carry a street railroad and general highway traffic. Baird Brothers, the contractors for the main bridge connecting the City of Wheeling with Wheeling Island, have that bridge, belonging to the same company, almost completed. The false work was removed from under the channel span last Saturday. There remains now on this bridge nothing to do but lay the flooring and street railroad tracks and to erect the viaduct which connects it with the island shore. This bridge was built by the Keystone Bridge Co. It carries a double track street railroad and stands 90 ft. above the Ohio River. It is composed wholly of through trusses.

RAILROAD LAW—NOTES OF DECISIONS.

Powers, Liabilities and Regulation of Railroads.

In the Supreme Court of the United States it is held that since a state has the right to tax personal property within its jurisdiction, even though it is employed in interstate commerce, a state tax on such proportion of the whole capital stock of a foreign sleeping-car company as the number of miles over which its cars are operated within the state bears to the whole number of miles over which its cars are operated, is valid and constitutional, though such cars run into, through and out of the state.[1]

In Minnesota the Supreme Court rules that a railroad cannot acquire title to land through a common law dedication of it to public use for railroad purposes.[2]

In Michigan by a statute the right to use any other than animal power was expressly conferred, to be exercised under the authority and direction of the municipal authorities. The act of 1871, § 1, provided for the operation of a tram railroad for the conveyance of persons or property, to be operated by horse or other animal power, or by steam, or by pneumatic or any other motive power, or by any combination of them. The Supreme Court rules that these provisions authorized the use of electric power, although not discovered until after their enactment.[3]

In New York it is held by the Supreme Court that where the directors of the company which operates a railroad cause the cars to be heated in a manner prohibited by the "Car Heating Act," 1887, they are subject to the penalty; it not being the intention to limit the guilt for the violation of the statute to the persons or corporations operating the railroad. Where the "Car Heating Act" has been violated by the company operating the railroad, the officers and directors of such company are not liable merely because they are officers and directors, but it must be shown that they personally participated in the commission of the offense.[4]

A Minnesota statute provides that when a plat is made out and recorded as required by the statute, every grant or donation to the public or to any corporation, marked or noted on such plat, shall be sufficient, in law and equity, to vest the fee simple of such land "as therein expressed," etc. On a town plat was shown a strip of land not divided into lots, on which were the words, "Reserved for right of way, line of S. M. R. R." The Supreme Court rules that the intent to donate to the railroad company was not sufficiently shown.[5]

In the Federal Court it is held that under the act of Congress of 1875 requiring a railroad company, in order to secure a right of way over government land, to file with the Secretary of the Interior a copy of its articles of incorporation, with proof of its organization, and to file with the Register of the Land Office a profile of its road, the railroad company, and not the contractor who builds the road, is bound to comply therewith.[6]

In the same case it is ruled that the railroad company, and not the owner of all its stock and bonds, owns its right of way, and the latter cannot maintain an action in relation thereto.[7]

In Indiana the Supreme Court rules that where a railroad is consolidated with another its land vests in the latter; and in the Federal Court it is laid down that a railroad corporation formed by the consolidation of several corporations chartered by different states, which bears the same name in all the states, and, under one management, is operated as an entirety, in the absence of statutory provision to the contrary, may transact its business in one state for all; and the contracts it enters into in one state are binding on it in all, and may be enforced against it in either when the action is transitory.[8]

In the Federal Court a contract between the C., R. I. & P. R. Co. and the D. & R. G. R. Co. gave the former the right to use the latter's tracks, depots, etc., on and along its line "between and including Denver" and South Pueblo, meaning and intending to include all its railroad and appurtenant property "between and at the points aforesaid." It stipulated also that the contract should be binding on the lessees, assigns, grantees and successors of each company during the continuance of their franchises, and provided that the former company could assign its interest in the contract only by sale, lease or consolidation of its own property. The court decides that an assignment or conveyance by the C., R. I. & R. Co. of its interest in the contract by virtue of leases, sales, and consolidation of its property, carried with it all the rights of said company under the contract. And it is also held that the contract gives the railroad the right to use the depot grounds and property of defendant in Denver for the handling of its freight and passenger business, without respect to the road over which it may haul its cars.[9]

An Ohio statute provides that railroad property shall be subject to taxation in a district in the proportion that the mileage of its track therein bears to its whole track. The Supreme Court holds where a tax was levied upon the property of a railroad company in a taxing district under the "one-mile assessment pike law," for the improvement of a turnpike, that, the rule of equality having been observed in making the levy, its payment could not be defeated by showing that no direct or pecuniary benefit would accrue to the property or owner from the proposed tax.[10]

The Supreme Court of the United States rules that the stock that a railroad company owns in an elevator company which owns and operates an elevator near the terminus of the railroad company, which uses the elevator for the storage of grain, is not an "appurtenance" of the railroad, and does not pass under a mortgage of such railroad "and its appurtenances."[11]

Carriage of Goods and Injuries to Property.

In Texas in an action against a railroad company for damages for the loss of one of five barrels of whisky consigned to plaintiff, the bill of lading, which was signed neither by the consignor nor consignee, provided in a foot-note that "claims for loss or damage must be presented to the delivering line within 36 hours after the arrival of the freight." The Supreme Court rules that this provision would be applicable to freight which in fact was never delivered, and that it must be regarded as waived by a promise of defendant's agent, made when the four barrels were delivered, that the missing barrel should be found and delivered in a few days.[12]

In Iowa it is held by the Supreme Court that when in another state goods are delivered to a railroad to carry to Iowa under a contract limiting liability valid in that state but void in Iowa, the contract is valid though the goods are lost or damaged in Iowa.[13]

In Texas the Supreme Court rules that a railroad cannot escape liability for failure to feed and water stock while in course of shipment, by a stipulation in the contract by which the shipper agrees to feed and water them, if the carrier does not show that it offered the shipper reasonable facilities for doing so; nor does the shipper's failure to notify the carrier of his wish to feed and water affect the carrier's liability.[14]

In Mississippi a statute incorporating a railroad company confined authority to enter upon lands through which it should deem it necessary to make its "railroad," and (section 5.) in case of failure to agree with the owner of land as to the price to be paid him, to have the damages by reason of making "said road," assessed; and declared that the company should be invested with the right to "occupy and use such lands for the purposes of said railroad." The Supreme Court holds that the company was not limited to the right to take only enough land for a road-bed, but could acquire enough for station grounds, side tracks, etc. A single exercise of the right of eminent domain, conferred on a railroad company by legislative grant, does not exhaust the grant, and the right may be exercised a second time if the necessity arises.[15]

The Supreme Court of Iowa rules that under the code providing that no railroad track can be located in the streets or public places of a city until after the injury to the property abutting thereon has been ascertained and compensated for, where a railroad crosses a street at such an angle that plaintiff's lot lies opposite to a portion of the embankment rendered necessary for the construction of the roadbed, though not opposite to any portion of the track itself, the plaintiff is entitled to recover damages therefor.[16]

Injuries to Passengers, Employes and Strangers.

In Alabama it is held by the Supreme Court that where the conductor on a railroad train calls the name of a station, and the engineer, before reaching there, though without the conductor's knowledge, stops the train over a trestle, to take on water, the company is liable for injuries sustained by a passenger in getting off the train, if he was not notified, and the surroundings did not show, that he was not at the station.[17]

In Kentucky the Court of Appeals decides that for a passenger on a rapidly moving train to permit his hand to protrude from a window of the car in which he is sitting is such contributory negligence as to prevent his recovering damages for injuries received by its striking some object outside.[18]

In Pennsylvania the Supreme Court holds that an actual tender of fare, made before a train is stopped, cannot be refused by a conductor, no matter who makes the tender.[19]

In Indiana it is ruled by the Supreme Court where after a passenger on a railroad train has surrendered his ticket, the conductor asks him a second time for his fare, and, on his assertion that he has already given up his ticket and refusal to pay again, stops the train and proceeds to eject him, and such passenger then for the first time uses profane language, the company cannot, by reason of such language, escape liability for wrongfully ejecting him.[20]

In Alabama it is held by the Supreme Court that a railroad is not liable for the death of a passenger rightfully ejected when run over by another train after he was ejected, though he was intoxicated, where his intoxication was not sufficient to destroy consciousness, and the place where he was put off, with which he was familiar, was dangerous only to persons unnecessarily going on the track.[21]

In Alabama the Supreme Court rules that where it is customary for brakemen in the performance of their duties to ascend and descend from the tops of cars by side-ladders, while the train is in motion, the company is bound to maintain its roadway free from projections which endanger them while so doing.[22]

In Alabama the Supreme Court holds that where it is the duty of firemen to receive signals from switchmen coupling and uncoupling cars, and to transmit them to the engineer, the railroad company is liable for injuries to a switchman caused by the fireman's failure to transmit a signal.[23]

In Alabama it is held by the Supreme Court that a rule of a railroad, prohibiting switchmen to go between cars to couple or uncouple them, cannot be invoked to defeat the action of switchmen for injuries sustained when coupling cars while standing on a running-board put on the tender of an engine for switchmen to ride on.[24]

In Texas it is held by the Supreme Court that a United States mail agent, who sustains injury while riding in the postal car through the negligence of the railroad, is entitled to recover damages therefor, irrespective of any question as to the company's compensation for transporting him. Where the plaintiff, who was a United States mail agent, was riding in the proper place in his car, the fact that such car was more dangerous to ride in than other cars in no way affects the right of recovery.[25]

In New York it is held by the Court of Appeals that a clause in a contract between an express company and a railroad company that the latter is "hereby expressly released from and guaranteed against any liability for any damage done to the agents of the [express company], whether in their employ as messengers or other-

wise," is not such an unequivocal exemption of the railroad company as will bar an action against it for the death of an express messenger, injured while on the road by the negligence of its servants.[26]

In Alabama the Supreme Court decides that in an action for injuries sustained by a passenger while attempting to board a moving train, defendant is liable where it appears that the train, instead of coming to a full stop at the station, as it should have done, merely slacked its speed to the rate of about two miles per hour; that while the train was moving at such rate the conductor cried "All aboard!" whereupon plaintiff attempted to board the train; and that, while plaintiff was in such position that any sudden and unexpected acceleration of speed involved great peril to him, the conductor, with full knowledge of plaintiff's position, caused the train to suddenly start forward, whereby plaintiff was injured, though plaintiff may have been guilty of contributory negligence in attempting to board the moving train.[27]

In Illinois the Supreme Court rules that the statute requiring a bell or whistle to be sounded at least 80 rods from a crossing, and to be kept going until the crossing is reached, applies also to trains which start from a point less than 80 rods from a crossing.[28]

In Alabama the Supreme Court decides that a person familiar with a railroad crossing, and knowing that engines constantly pass back and forth over the tracks there, is guilty of such contributory negligence as to preclude his recovery when, in attempting to cross without looking to the right or left, he is struck by a switch-engine that was plainly visible for some distance before it reached the crossing; and the facts that the engine was moving at an unlawful rate of speed, and that the company's watchman, at whom plaintiff was looking, failed to warn him, but sat inattentive to plaintiff or the approaching train, do not so neutralize the effect of plaintiff's contributory negligence as to make it a question for the jury.[29]

In New York the Court of Appeals (reversing the Superior Court) rules that where deceased waited for the passage of a train on one of defendant's tracks, stepped on to an adjoining track, and was run over by a train which he could have seen had he stopped to look, he was guilty of contributory negligence.[30]

The Court of Appeals of West Virginia holds that the code requiring a bell to be rung or a whistle to be blown at crossings, is designed to protect those crossing the track at such crossings, not for those using the track elsewhere for their convenience as a foot-path.[31]

In Utah the Supreme Court holds that a laborer employed to load cars at night at defendant's coal chutes and who has been so employed for several nights, so that he is familiar with the premises, knows the location of the chutes and is accustomed to operate the cars, cannot recover for injuries occasioned by being caught between a chute and a moving car on which he was standing, on the ground that the company had failed to provide sufficient light, when the lights were sufficient for him to sort the coal by and at the time of the accident he had his back to the chute, but could have easily seen it if he had looked.[32]

[1] Pullman Pal. Car. Co. v. Com., 11 S. C. Rep., 876.
[2] Watson v C., M. & St. P. Ry. Co., 48 N. W. Rep., 1129.
[3] Detroit C. R. Co. v. Mills, 48 N. W. Ref., 1,007.
[4] People v. Clark, 14 N. Y. S 642.
[5] Watson v. C., M. & St. P. Ry Co., 48 N. W. Rep , 1,129.
[6] Fitzgerald v. M. P. Ry. Co., 45 Fed. Rep , 812
[7] Fitzgerald v. M P. Ry. Co., 45 Fed. Rep., 812.
[8] Cashman v. Brownlee, 27 N. E. Rep., 560; Fitzgerald v. Mo. Pac. R. Co., 45 Fed. Rep., 812.
[9] C., R. I. & P. v. D. & R. G. R. 46 Fed. Rep., 145.
[10] N. Y., L. E. & W. R. Co. v. Commissioners of Marion County, 27 N. E., Rep., 548.
[11] Humphreys v. McKissock, 11 S. Ct., 779.
[12] G., H. & S. A. Ry. Co. v Ball, 16 S. W. Rep , 441.
[13] Hazel v. C. M. & St. P. R. Co., 48 N. W. Rep. 926.
[14] Taylor v. B. & H. R. Co., Montgomery, 16 S. . Rep., 178.
[15] Ewing v. Ala. & V. Ry. Co., 9 South. Rep., 295.
[16] Gates v. Co., St. P. & K. C. R. Co., 48 N. W. Rep., 1,040.
[17] R. & D. R. Co. v. Smith, 9 South. Rep., 223.
[18] Favre v. L. & N. R. Co., 16 S. W. Rep., 370.
[19] Ham v. President, etc., D. & H. C. Co., 21 Art. Rep., 1012.
[20] L., N. A. & C. Ry. Co. v. Wolfe, 27 N. E. Rep., 606.
[21] L. & N. R. Co. v. Johnson, 9 South. Rep., 269.
[22] G. Pac. Ry. v. Davis (Ala.) 9 So. 252.
[23] R. & D. R. Co. v. Jones, 9 South. Rep., 276.
[24] R. & D. R. Co. v Jones, 9 South. Rep., 276.
[25] Gulf, C. & S. F. Ry. Co. v. Wilson, 15 S. W. Rep., 280.
[26] Kenney v. N. Y. C. & H. R. R. Co., 26 N. E. Rep., 625.
[27] Montgomery & E. Ry. Co. v. Stewart (Ala.), 8 South. Rep., 708.
[28] L. S. & M. S. R. Co., v. Johnson, 26 N. E. Rep., 510.
[29] L. & N. R. R Co. v. Webb, 8 South. Rep., 518.
[30] Daniels v. Staten Island Rapid Transit Railway Co., 26 N. E. Rep., 466.
[31] Spicer v. C. & O. Ry. Co., 12 S. E. Rep., 553.
[32] Quitell v. Un. Pac. R. Co., 25 Pac. Rep., 724.

MEETINGS AND ANNOUNCEMENTS.

Dividends.

Dividends on the capital stocks of railroad companies have been declared as follows:

Boston & Albany, quarterly, $2 per share, payable Sept. 30.
Chicago & Northwestern, quarterly, 1¾ per cent. on preferred stock, payable Sept. 24.
Cleveland, Cincinnati, Chicago & St. Louis, quarterly, 1¼ per cent. on the preferred stock, payable Oct. 1.
Connecticut River, quarterly, 2 per cent., payable Oct. 1.
Keokuk & Western, 1 per cent, payable Oct. 1.
Lehigh Valley, quarterly, 1¼ per cent., payably Oct. 15.
Manhattan (Elevated), quarterly, 1½ per cent., payable Oct. 1.

Stockholders' Meetings.

Meetings of the stockholders of railroad companies will be held as follows:

Boston & Albany, annual, Boston, Mass., Sept. 23.
Chicago, Milwaukee & St. Paul, annual, Milwaukee, Wis., Sept. 16.
Chicago, Detroit & Canada Grand Trunk Junction, annual, Detroit, Mich., Sept. 30.
Connecticut River, annual, Springfield, Mass., Sept. 16.
Detroit & St. Clair River, special, St. Clair, Mich., Sept. 15.
Fitchburg, annual, Boston, Mass., Sept. 30.
Louisville & Nashville, annual, Louisville, Ky., Oct. 7.
Michigan Air Line, annual, Detroit, Mich., Sept. 30.
Minneapolis, St. Paul & Sault Ste. Marie, annual, Minneapolis, Minn., Sept. 16.
Montreal & Ottawa, special, Montreal, P. Que., Sept. 29.
New Jersey & New York Extension Railroad Company, special, 120 Broadway, New York City, Sept. 30, to vote upon a proposed increase of capital stock.
New York, Ontario & Western, annual, 18 Exchange Place, New York City, Sept. 30.
Old Colony, annual, Boston, Mass., Sept. 29.
St. Paul & Duluth, annual, St. Paul, Minn., Oct. 8.

Technical Meetings.

Meetings and conventions of railroad associations and technical societies will be held as follows:

The *American Association of General Passenger and Ticket Agents* will hold its next annual convention at Old Point Comfort, Va., Sept. 15.

The *American Association of Railroad Clerks* will hold its second national convention at St. Louis, Mo., beginning Sept. 16.

The *International Brotherhood of Railway Conductors* will hold its third annual convention at Louisville, Ky., Sept. 21.

The *New England Railroad Club* meets at its rooms in the United States Hotel, Beach street, Boston, on the second Wednesday of each month, except June, July and August.

The *Western Railway Club* holds regular meetings on the third Tuesday in each month, except June, July and August, at the rooms of the Central Traffic Association in the Rookery Building, Chicago, at 2 p. m.

The *New York Railroad Club* will hold its next meeting at its rooms, in the Gilsey House, New York City, at 2 p. m., on the third Thursday in September.

The *Southern Railway Club* holds regular meetings on the third Thursday of the months of January, February, March, May, September and November at such points as are selected at each meeting.

The *Central Railway Club* meets at the Hotel Iroquois, Buffalo, the fourth Wednesday of January, March, May, September and November.

The *Northwest Railroad Club* meets on the first Saturday of each month, except June, July and August, in the St. Paul Union Station, at 7:30 p. m.

The *Northwestern Track and Bridge Association* meets on the Friday following the second Wednesday of each month at 7:30 p. m. in the directors' room of the St. Paul Union Station, except in the months of July and August.

The *American Society of Civil Engineers* holds its regular meetings on the first and third Wednesday in each month, at the House of the Society, 127 East Twenty-third street New York

The *Boston Society of Civil Engineers* holds its regular meetings at the American House, Boston, at 7:30 p. m., on the third Wednesday in each month.

The *Western Society of Engineers* holds its regular meetings at 78 La Salle street, Chicago, at 8 p. m , on the first Wednesday in each month.

The *Engineers' Club of St. Louis* holds regular meetings in the club's room, Laclede Building, corner Fourth and Olive streets, St. Louis, on the first and third Wednesdays in each month.

The *Engineers' Club of Philadelphia* holds regular meetings at the House of the Club, 1,122 Girard street, Philadelphia, on the first and third Saturday of each month, excepting in January, when the annual meeting is held on the second Saturday of the month. The second January meeting is held on the third Saturday. The club stands adjourned during the months of July, August and September.

The *Engineers' Society of Western Pennsylvania* hold regular meetings on the third Tuesday in each month, at 7:30 p. m., at its rooms in the Thaw Mansion, Fifth street, Pittsburgh, Pa.

The *Engineers' Club of Cincinnati* holds its regular meetings at 8 p. m. on the third Thursday of each month in the rooms of the Literary Club, No. 24 West Fourth street, Cincinnati.

The *Civil Engineers' Club of Cleveland* holds regular meetings on the second Tuesday of each month, at 8 p. m., in the Case Library Building, Cleveland. Semi-monthly meetings are held on the fourth Tuesday of the month.

The *Engineers' Club of Kansas City* meets in Room 200, Baird Building, Kansas City, Mo., on the second Monday in each month.

The *Engineering Association of the South* holds its monthly meetings on the second Thursdays at 8 p. m The Association headquarters are at Nos. 63 and 64 Baxter Court. Nashville, Tenn.

The *Denver Society of Civil Engineers and Architects* holds regular meetings at 36 Jacobson Block, Denver, on the second and fourth Tuesday of each month, at 8 o'clock p. m., except during June, July and August, when they are held on the second Tuesday only.

The *Civil Engineers' Society of St. Paul* meets at St. Paul, Minn., on the first Monday in each month.

The *Montana Society of Civil Engineers* meets at Helena, Mont., at 7:30 p. m., on the third Saturday in each month.

The *Civil Engineers' Association of Kansas* hold regular meetings at Wichita on the second Wednesday of each month at 7:30 p. m.

The *American Society of Swedish Engineers* holds meetings at the club house, 250 Union street, Brooklyn, N. Y., and at 347 North Ninth street, Philadelphia, on the first Saturday of erch month.

The *Engineers' Club of Minneapolis* meets the first Thursday of each month in the Public Library Building, Minneapolis, Minn.

The *Canadian Society of Civil Engineers* holds regular meetings at iss rooms, 112 Mansfield street, Montreal, P. Que., every alternate Thursday except during the months of June, July, August and September.

The *Association of Civil Engineers of Dallas* meets at 803 Commerce street, Dallas, Tex., on the first Friday of each month at 4 o'clock p. m.

The *Montana Society of Civil Engineers* meets at Helena, Mont., at 7:30 p. m., on the third Saturday in each month.

The *Civil Engineers' Association of Kansas* holds regular meetings at Wichita on the second Wednesday of each month, at 7:30 p.

The *American Society of Swedish Engineers* holds meetings at the club house, 250 Union street, Brooklyn, N.Y., and at 347 North Ninth street, Philadelphia, on the first Saturday of each month.

The *Engineers' Club of Minneapolis* meets the first Thursday of each month in the Public Library Building, Minneapolis. Minn.

The *Canadian Society of Civil Engineers* holds regular meetings at its rooms, 112 Mansfield street, Montreal, P. Que., every alternate Thursday except during the months of June, July, August and September.

The *Technical Society of the Pacific Coast* holds regular meetings at its rooms in the Academy of Sciences Building, 819 Market street, San Francisco, Cal., at 8 p. m. on the first Friday of each month.

Master Car Builders' Association.

At the meeting of the executive committee of the M. C. B. Association this week at Buffalo, some important business was transacted. Among other matters the new coupler gauge was decided upon and the form proposed by the secretary was accepted. The secretary was instructed to have the gauges built by the Pratt & Whitney Co., Hartford, Conn., as soon as possible. The drawings of the gauges and full instructions for using them will be issued next week. The subjects for next year were selected and committees appointed. A memorial was prepared to be presented to the relatives of the late Leander Geary. The results of the letter ballot are to be sent to members this week.

The New York Railroad Club.

The first regular meeting of this club, after the summer vacation, will be held at the Club Rooms, Gilsey House, Thursday afternoon, Sept. 17, at 2 o'clock. Probably there will be no papers presented, but the Executive Committee hopes that members will come prepared to present topics for discussion at future meetings and to take some measures to indicate the subjects that they would like to have taken up during the winter season.

The Western Railway Club.

The first meeting of the season of 1891-92 will be held on Tuesday, Sept. 15, at 2 p. m., in the rooms, 850-54 Rookery Building, Chicago.

Officers for the ensuing year will then be elected, and the topic of air brake practice will be introduced by Mr. G. W. Rhodes, of the C., B. & Q., under the title of

"Air Brake Practice; a brief talk on the proposed M. C. B. Rules."

All interested are cordially invited to attend.

PERSONAL.

—Mr. C. Buetgenbach has resigned as Southern Passenger Agent of the Chesapeake & Ohio, and will retire from that position Oct. 1.

—Mr. Albert Griggs, Superintendent of Motive Power of the New York & New England, with headquarters at Norwood, Mass., has resigned.

—Mr. Frank Livingstone, formerly connected with the Long Island Water Supply Co, has been appointed Master Mechanic of the New York & Brooklyn Bridge, vice Edward Crane, resigned.

—Mr. Geo. H. Davis, who has been Traveling Live Stock Agent for the Hannibal & St. Joseph, has been appointed General Live Stock Agent of the Burlington system, with headquarters at Kansas City, Mo.

—Mr. J. C. Shaw, for the last 15 years connected with the passenger department of the Central of Georgia, will retire from the company's employ Oct. 1, and his office as travelling Passenger Agent, will be abolished.

—Mr. C. F. Kerchner has resigned as Superintendent and General Freight and Passenger Agent of the Baltimore & Lehigh, and accepted the position of General Sales Agent of the Monongahela Coal and Coke Company, with headquarters at Monongahela, W. Va.

—Mr. R. J. Gross, of Dunkirk, N. Y., connected with the Brooks Locomotive Works, has been appointed agent to represent the locomotive department of the World's Fair in Europe and induce foreign makers to exhibit. Mr. Gross sailed on the "City of Rome" last Saturday.

—Mr. A. C. Bassett, who resigned as Manager of the Coast Division of the Southern Pacific last June, that division having been merged with other lines of the company, has been presented by his friends on the road with a solid silver tea and coffee service. Mr. Bassett held this position about 15 years.

—Mr. C. N. Chevalier, late Division Superintendent on the New York & New England, has been appointed General Superintendent of the Government Railroads in Nicaragua, with headquarters at Managua. These lines aggregate 91 miles of railroad, and there is a steamer line of 30 miles connecting the two portions of the railroad.

—Mr. Edward McIntyre, Comptroller of the Central of Georgia, with headquarters at Savannah, Ga., has resigned that position. Mr. McIntyre has been with the road for 33 years. After serving some time as a clerk he was made Auditor under the reorganization in 1865. He subsequently became bookkeeper and then Treasurer, and about five years ago he was elected to the present position. H. C. Ansley, of Birmingham, is temporarily filling the office of Comptroller.

ELECTIONS AND APPOINTMENTS.

Austin & Northwestern.—At a recent meeting of the stockholders, at Austin, Tex., all of the officers and most of the old directors resigned, and the following were elected in their places: Charles Dillingham, Houston, Tex., President; A. N. Leitnaker, Austin, Vice-President; Edward B. Dillingham, Secretary and Treasurer; J. J. Atchison, C. P. Huntington and J. E. Gates, of New York, and C. C. Gibbs and E. N. Cave, of Houston.

Baltimore & Lehigh.—W. R. Crumpton, formerly General Manager of the Bellaire, Zanesville & Cincinnati, has been appointed General Manager of the Baltimore & Lehigh, with headquarters at Baltimore, Md.

Baltimore & Ohio.—P. Hayden, formerly of Pittsburgh, has been appointed Master Mechanic of the company's shops at Piedmont, W. Va., which have just been put into operation after an idleness of about a year.

C. F. Wood has been appointed Traveling Passenger Agent, with headquarters at Cleveland, O. He will report to L. S. Allen, Assistant General Passenger Agent, at Chicago, Ill.

Bellaire, Zanesville & Cincinnati.—James K. Geddes has been appointed General Manager, in addition to his duties as Chief Engineer, vice W. R. Crumpton, resigned to accept service with the Baltimore & Lehigh.

Brooklyn & Brighton Beach.—The following directors were re-elected at the Annual Meeting held Sept. 8: William Marshall, Aaron S. Robbins, Uriel A. Murdock, George I. Murphy, Abraham B. Bayliss, James Jourdan and Edward L. Langford.

Canadian Pacific.—R. Tweedle, a section foreman, has been appointed Roadmaster of the Edmonton branch

Chicago, Burlington & Northern.—J. C. Peasley has been appointed Treasurer, vice J. Murray Forbes, who continues President. N. B. Hinckley, formerly Auditor, has been appointed Auditor and Assistant Treasurer; C. H. Boardman has been appointed Traveling Passenger Agent, with headquarters at Nashville, Tenn., vice C. F. Ludlum, deceased.

Chicago & Erie.—T. A. Lawes has been appointed Master Mechanic, with headquarters at Huntington, Ind., vice R. F. Kredell, resigned.

Chicago, St. Paul & Kansas City.—The following directors were chosen at the annual meeting held at Dubuque, Ia., Sept. 3: William L. Boyle, C. W. Benson, William Dawson, Ansel Oppenheim, A. B. Stickney, S.C. Stickney, John M. Egan, Arnold Kalman, A. N. Drake, David Rankin, A. Slimmer, M. Auerbach, John L. Pratt, J. W. Lusk and F. D. Stout. The only change in the board was the election of Arnold Kalman, M. Auerbach and J. W. Lusk,to succeed Frank B. Clark, A. Crawford and I. L. Elwood.

J. A. Keller, formerly Train Master at Kansas City, Mo., has been appointed Division Superintendent in charge of the Kansas City division between St. Joseph and Kansas City.

Cincinnati, Portsmouth & Virginia.—M. C. F. Musselman, general foreman of shops, has been appointed Master Mechanic, vice J. C. Homer, resigned.

Cleveland, Cincinnati, Chicago & St. Louis.—James Ritchie, formerly Principal Assistant Engineer of the Cleveland & Mahoning Valley, and later General Superintendent of the McKeesport & Belle Vernon, has been appointed Principal Assistant Engineer of this company.

Denver & Rio Grande.—The resignations of President D. H. Moffat and General Manager S. T. Smith were accepted at a meeting of the Board of Directors held in New York City, Sept. 5.

Erie & Huron.—The principal office of the company will, on Oct. 1, be removed from Sarina to Chatham, Ont.

Farmville & Powhatan.—R. T. Wilson has been appointed General Freight and Passenger Agent in addition to his duties as Auditor of the company.

Flint & Pere Marquette.—L. H. Plues having resigned as General Baggage Agent, that office has been abolished and the duties pertaining to the same transferred to the Traffic Manager.

Florida Midland.—A. F. Odlin has been appointed General Counsel, with office at Orlando, Fla.

Harrisburg, Lancaster, Mount Joy & Portsmouth.—The annual meeting of the company was held in Philadelphia, Pa., Sept. 4, and the following directors elected: Edmund Smith, George B. Roberts, James Young, N. Parker Shortridge, Lewis Elkin, A. J. Cassatt, John P. Green, Enoch Lewis and Thomas Williams, Jr.

International & Great Northern.—Judge McCord, of the United States District Court, at Tyler, Tex., has decided to continue the receivership of the road, with T. M. Campbell as sole Receiver, T. R. Bonner, co-Receiver, having died. Mr. Campbell's office is at Palestine. Tex.

Iowa Central.—The annual meeting of the company was held in Chicago, Ill., Sept. 5, when the following Directors were elected: Russell Sage, H. J. Morse, G. E. Taintor, E. E. Chase, C. H. Ackert, George R. Morse, Dunlap Smith, Russell Sage, Jr., and Rufus H. Sage. Russell Sage was re-elected President, and George R. Morse, Secretary and Treasurer. Edward E. Chase was elected Vice-President.

Jacksonville Southeastern Line.—The office of W. C. Alvord, General Freight Agent, has been transferred from Peoria, Ill., to Jacksonville, Ill.

Louisville & Nashville.—H. P. Gray has been appointed Traveling Freight Agent, with headquarters at Kansas City, Mo., vice O. W. French, transferred.

Louisville, New Albany & Chicago.—Geo. K. Lowell has been appointed Assistant Superintendent, with headquarters at Lafayette, Ind.

Macon, Dublin & Savannah.—The officers of this road are: President, D. M. Hughes; Vice President, H. S. Morse; General Manager, James T. Wright; General Superintendent, J. B. Maxon, and Auditor, E. W. Dautell. The general offices of the company are at Macon, Ga.

Minneapolis & St. Louis.—J. L. Blake has been appointed Travelling Freight Agent, with headquarters at Minneapolis, Minn., vice C. L. Wales, deceased.

Missouri Pacific.—W. J. Hill has been appointed Assistant Master Mechanic of the lines in Kansas and Colorado, with headquarters at Osawatomie, Kan., vice H. M. Smith, who resigned to accept service with another company.

Newport News & Mississippi Valley.—The headquarters of H. G. Wills, General Baggage Agent, have been transferred to Memphis, Tenn., from New Orleans, La.

New York & Brooklyn Bridge.—Frank Livingstone has been appointed Master Mechanic to succeed Edward Crane, resigned; office at Brooklyn, N. Y.

Ohio Valley.—W. E Morse has been appointed Assistant Superintendent, with headquarters at Paducah, Ky. W. Greenfield has been appointed Car Accountant, with headquarters at Louisville, Ky.

Paducah, Tennessee & Alabama.—The officers of this road are: General Superintendent, W. E. Dauchy; Acting General Freight and Passenger Agent, A. J. Welsh; and Auditor, A. R. Myers. The general offices are at Paducah, Ky. This road is in operation from Paducah to Paris, 65 miles, and an extension is being built from the latter place south to Hollow Rock, Tenn., 24 miles.

Rio Grande Western.—W. H. Snedaker has been appointed General Agent of the freight and passenger department, with office at No. 14 Montgomery street, San Francisco, vice C. H. Clarke, resigned.

Roanoke & Southern.—The following Board of Directors was elected at the annual meeting of the company in Roanoke, Va., Sept. 8: R. A. Buckner, S. W. Jameson, E. H Stewart, J. T. Engleby, Roanoke; P. P. Watson, John T. Coen, J. H. Mathews, Martinsville; F. J. Stone, Stonevil e, N. C.; J. W. Alspaugh, J. W. Fries, J. E. Gilmer, J. A. Gray, C. H. Fogle, Winston-Salem, N. C., and R. C. Hoffman and George C. Jenkins, of Baltimore, Md. The Directors elected the following officers: J. W. Fries, to succeed H. S. Trout, of Roanoke, as President; H. S. Trout, First Vice-President; Gen. John Gill, of Baltimore, Second Vice-President; J. H. Spencer, Martinsville, Third Vice-President; Secretary, R. L. Hautz. G. W. Maslin, former Superintendent, promoted to General Manager; Treasurer, R. D. Langford. Major O. Onderdonk was re-elected Chief Engineer. Executive Committee: J. W. Fries, Salem, N. C., J. E. Gilmer, P. P. Watson, E. H. Stewart and F. J. Stone.

Rome (Georgia).—The officers of this road now are: President, W. W. Brookes; Superintendent and General Freight and Passenger Agent, W. F. Ayer; Auditor, O. R. Bilbro; and Treasurer, J. H. Rhodes. The general offices are at Rome.

St. Louis & Hannibal.—W. W. Driggs has been appointed Auditor of the company, in addition to his position of General Freight and Ticket Agent, vice F. C. Cake, resigned.

St. Louis Southwestern.—Thomas Inglis has been appointed Master Mechanic of the St. Louis Southwestern, of Texas, and Tyler Southwestern roads, with headquarters at Tyler, Tex., vice R. M. Galbraith.

Tamaroa & Mount Vernon.—The incorporators and first board of directors of this Illinois road are: H. Clay Horner, John C. Gerlash, Charles E. Kingsbury and James J. Morrison, all of Chester, Ill.

Terminal Railroad Association of St. Louis.—H. M. Smith, who recently resigned as Assistant Master Mechanic of the Missouri Pacific lines in Kansas, has been appointed Master Mechanic of this road. This company operates the St. Louis Bridge & Tunnel Railroad.

Texas & Pacific.—W. L. Bass has been appointed General Baggage Agent, to succeed W. J. Taylor, who was recently appointed General Live Stock Agent. B. G. Saunders has been appointed Contracting Agent, with office in New York City, to succeed F. E. Brown.

Toledo, St. Louis & Kansas City.—The annual meeting of stockholders was held in Toledo, O., Sept. 9, and the election of the following board of directors was the result: S. R. Callaway and Clarence Brown, Toledo; Franklin J. Sawyer, Buffalo; C. F. Tag, Hoboken, N. J., and Robert Harris, F. L. Russ, J. S. Stout, Randolph F. Purdy, William F. Fay, W. Howard Gilder, Robert G. Ingersoll, Sylvester H. Kneeland and James M. Quigley, New York. The only change in the board was the election of S. H. Kneeland, R. F. Purdy, W. F. Fay and F. J. Sawyer to succeed H. O. Armour, John C. Havemeyer, Henry A. Neal and William Patton.

Union Pacific.—Robert W. Baxter has been appointed Superintendent of the Wyoming division, with headquarters at Cheyenne, to succeed C. E. Wurtele. Mr. Baxter has previously held this same position.

Wabash.—The stockholders held their annual meeting in St. Louis, Mo., Sept. 8, and the present Board of Directors was re-elected, as follows: O. D. Ashley, Edgar T. Welles, Cyrus J. Lawrence, Sidney Dillon, George J. Gould, John T. Terry, Thomas H. Hubbard, Russell Sage of New York; Charles M. Hays and James F. How, St. Louis; Henry K. McHarg, Stamford, Conn.; S. C. Reynolds, Toledo, Ohio, and James F. Joy, Detroit, Mich.

Wagner Palace Car Co.—The following District Superintendents have been appointed: T. C. Clarke, at New York, to succeed C. R. Wager; A. J. Grant, at Chicago, Ill., vice L. W. Devenpeck; J. H. McBride, at St. Louis, Mo., vice W. B. Harner.

Zuni Mountain.—The incorporators of this New Mexico road are: J. E. Saint, W. M. Weaver and N. B. Field, of Albuquerque, N. M., and A. W. Mitchell and W. W. Mitchell, of Cadilla c, Mich. The headquarters of the company will be at Albuquerque.

RAILROAD CONSTRUCTION,

Incorporations, Surveys, etc.

Austin & Northwestern.—The company is changing the road, which extends from Austin to Marble Falls, Tex., 76 miles, to standard gauge, and expects to have the work for the entire distance completed by Oct. 1.

Bishopville.—The road will apply to the South Carolina Legislature at its next session for authority to extend the line in a general northerly or northwesterly direction as far as the North Carolina state line; also to build an extension from Atkins in a south or southeasterly direction to some point on the Central Railroad of South Carolina.

Burlington & Missouri River.—The citizens of Spearfish, S. D., have subscribed a fund of $40,000 to aid in the construction of a line from Deadwood, northwest by way of Spearfish to Minnesela, about 22 miles, recently surveyed by this company.

Calgary & Edmonton.—Grading on the line from Calgary south to Fort McLeod, N. W. T., has reached High River, and track has been laid for a distance of 20 miles.

Camden, Watertown & Northern.—The surveys for this road, which is practically a continuation of the Elmira, Cortland & Northern, have been completed. The line is to extend from Camden, N. Y., on the Elmira, Cortland & Northern, by way of Brownville, to Watertown, passing through West Camden, Williamstown, Sand Bank, Pulaski, Sandy Creek, Mannsville, Pierrepont Manor, Bellville, Smithfield, Dexter and Round Hook, a distance of 65 miles. A branch is also projected from Bellville north to Henderson Harbor, five miles; and this will be ultimately extended from Brownville to Clayton. The work is generally light; there will be one bridge between 500 and 600 feet long across the Salmon River two miles east of Pulaski; also a bridge across the Black River with a span of 200 feet. The road, when built, will extend along west of the Rome, Watertown & Ogdensburg road from Rome to Watertown, and across the Oswego branch of the same road between Pulaski and Rutland. The representatives of the company say that contracts will soon be let and work begun within two months.

Cerro Blanco.—This road, which is being built by a mining company of Sonora, Mex., is nearing completion. It is to connect the station of Cerro Blanco, on the Sonora railroad, which is a part of the Atchison, Topeka & Santa Fe system, with the mines of the same name, located 17 miles from the station in the heart of the Sierra Madre. The new road is of 24-in. gauge and the permanent way is well constructed. The ascent is about 2,500 ft. in 12 miles, and this altitude is attained by a series of curves, some of which are of 45 degree , and on grades of 6 per cent. More than three-fourths of this work is now completed and the tracklaying will be resumed as soon as a tunnel 600 ft. long is finished. At the mines the company is getting its mill ready to commence work as soon as the road is completed. Connected with this mill will be a steam stamp, which is expected to crush about 100 tons of ore per day.

Charleston & Savannah.—This company is building an extension of the Ashley River Railroad along the Ashley River water front at Charleston, S. C., to reach the phosphate manufactories in the vicinity.

Chattanooga & Gulf.—This road was originally organized as the Crawfish Springs & Round Mountain, and later changed to Chattanooga & Durham. The charter of the latter was recently amended, and now bears the name of the Chattanooga & Gulf. Construction is now in progress from Chickamauga, Ga., to Round Mountain, an elevation of Lookout Mountain, 17½ miles, where the Crawfish Springs Land Co., which is building the road, owns coal mines. J. C. Henderson, of Chattanooga, Tenn., is General Manager.

Chesapeake & Ohio.—The first passenger train on the Warm Springs branch from Covington north to Warm Springs, Va., 25 miles, was run Aug. 29. Work of laying track was commenced last May. On the New castle & Bessemer branch, just opened, there is one passenger train running each way daily.

Chicago & Northwestern.—Officers of the road deny the report that a road is being built by the company from Chester northwest to Waupun, Wis.

Chicago & West Michigan.—J. H. McLane & Co., the contractors on the Chicago & North Michigan, have laid 10 miles of track from Traverse City, Mich., the southern terminus, and grading is in progress on the remainder. The line is to extend from Traverse City, the northeastern terminus of the Traverse City division of the Grand Rapids & Indiana, northeast via Williamsburgh, Bellaire, Central Lake and Charlevoix to a connection with the Grand Rapids & Indiana at Petoskey, Mich., 81 miles, with a branch from Williamsburgh to Elk Rapids, nine miles. The maximum grade is one per cent. and the maximum curvature four degrees. The principal business of the road will be in lumber and manufactures and the summer passenger travel. It is expected to have the road open for traffic by July 1, next year.

Cincinnati, Union City & Chicago.—Surveys have been commenced on this road, which is projected to extend from Union City, Ind., northeast by way of Portland and Bluffton to Huntington, Ind., a distance of about 70 miles, passing through the counties of Jay, Wells and Huntington.

Columbia River & Astoria.—The work of locating this proposed road is now in progress. The route is from Astoria, Or., eastward along the south bank of the Columbia River about 60 miles to Gobles, where the Northern Pacific transfers trains across the Columbia River. The work will not be very heavy. Maximum grades will not exceed from 10 to 15 ft. per mile, and the maximum curvature will be about six degrees. Several wooden draw bridges, some pile trestling and a few short tunnels will be required.

Dakota, Wyoming & Missouri River.—C. D. Crouch, of Rapid City, S. D., has received the contract for constructing the first 30 miles of this road, and not 100 miles as stated in our last issue. The road is to extend from Rapid City, S. D., west by north through Pactora and Silver City, to a connection with the Burlington & Missouri River at Mystic; and from thence to coal fields in Wyoming, about 45 miles. The maximum grade is 90 ft. per mile. Rapid City has given $100,000 as a bonus toward the construction of the 30 miles William T. Coad, of Rapid City, is President, and F. S. D. Broughton is Chief Engineer.

Eastern Oregon.—The preliminary survey for this road, which was incorporated a year ago to build a road from Heppner, Or., to the coal mines at the head of Butte Creek, a distance of 26 miles, and from thence to Sumpter, Or., has been completed.

East Tennessee, Virginia & Georgia.—The surveyors of the company are locating a branch line from a point about four miles north of Anniston, Ala., to Cantey's Anniston Lime Works. The branch will be four miles long, leaving the main line where it crosses Cane Creek.

Everett, Granite Falls & Eastern.—Articles of incorporation have been filed with the Auditor of Stevens County, Wash., to construct a railroad from a point at or near Port Gardner Bay to the city of Colville, Wash., and to construct such branch railroads as may hereafter be determined upon; to build, own or lease steamships and steamboats for service on the Snohomish River, Puget Sound and the Pacific or Atlantic Oceans; and to build, own and operate docks and warehouses. The capital stock is $10,000, divided into shares of $1,000 each. A. A. Allen, J. J. Folstad and F. M. Headlee are the incorporators. The principal office of the company will be located at Everett, Wash.

Flint & Pere Marquette.—A contract has just been awarded to M. Lally, of Detroit, Mich., for grading eight miles of road leaving the Harrison branch to one mile north of Budd Lake, Clare County, and extending to the mills of Neff and Prestel and Wilson Bros.

Glen Hazel & Shawmut.—The contract for grading five miles of this railroad, near Kettners, Pa., including an overhead crossing of the Clarion River and Pennsylvania Railroad, has been let. Construction is well under way and the contract for the balance of the work, 25 miles, is likely to be let within two or three weeks. The overhead crossing is the only important bridge or trestle work on the line.

Great Northern.—The company has filed notice with the Secretary of State at St. Paul, Minn., stating that it will construct a line from or near Wylie Station, Minn., on the St. Hilaire branch, in a southeasterly direction, by way of Red Lake Falls, to a point on the Fosston branch at or near Dugdale, a distance of about 25 miles. This line will be parallel with that of the Northern Pacific.

Halifax & Indian River.—This company has been organized in Florida by Robbins & Graham and others, of Titusville, Fla., with a capital of $500,000, to construct a railroad from Daytona on the Halifax River in a southeasterly direction to Titusville on the Indian River, a distance of 50 miles.

Houston, Central Arkansas & Northern.—The contractors on the southern division, Henry Forrest & Co., of St. Louis, Mo., expect to resume tracklaying about Oct. 20 from Columbia to a connection with the Houston & Texas Central at Alexandria, La., 60 miles. Two and a half miles of track have been laid since Jan. 1 of this year, and they expect to have the road for the entire distance completed about Dec. 31.

Los Angeles Terminal.—The grading has all been completed on the section from Los Angeles, Cal., to San Pedro, 20 miles, and track has been laid for a distance of six miles. The company now runs its Pasadena trains one mile further into the city of Los Angeles.

Mexican Southern.—The section of this road from Santa Cruz to Tecomavaca, reported last week, has been approved by the Mexican Government and opened for traffic.

Middle Georgia & Atlantic.—The preliminary surveys for the Savannah extension of this road from Savannah northwest toward Machen and Covington, has reached Statesborough, Bullock County, Ga., a distance of 40 miles from Savannah, and the survey for the permanent location will shortly begin.

Midland & East Tennessee.—Dispatches from Nashville, Tenn., state that the work of completing the remaining two miles of this road, which is to make a rail connection between Hartsville and Gallatin, is well under way, and will be completed within sixty days.

Minneapolis, St. Paul & Sault Ste. Marie.—The company has graded a new line from its terminus at Hankinson northwest to Valley City, N. Dak., a distance of about 90 miles. The tracklayers have passed the first crossing of the Cheyenne River, 40 miles above Hankinson. It is reported that 150 miles of grading north from Valley City has been let, and that this part of the line will be completed before the ground freezes.

All the track has been laid on the extension from Boynton to Bismarck, N. Dak., a distance of 10 miles.

Montana Central.—The branch from Monarch to Barker, Mont., 10⅓ miles, has been completed and trains are now running.

Mt. Vernon & Tamaroa.—This company has been organized in Illinois, with a capital stock of $500,000, to build a railroad from Tomaroa, Perry County, the eastern terminus of the Wabash, Chester & Western, north east to a connection with the Louisville, Evansville & St. Louis at Mt. Vernon, a distance of 20 miles. If the right of way can be secured soon enough the work of grading will commence Oct. 15.

New Roads.—The contract for the construction of a road projected to extend from Mann's Choice, on the Bedford division of the Pennsylvania, northeast to Brook's Mills, in Blair County, on the Altoona division of the same road, a distance of about 28 miles, has been let to Col. Hobart, of Vermont. While the proprietors of the road are private individuals, it is said that the control is really held in the interest of the Pennsylvania road.

The road which is being built by the Itasca Lumber Co. from Grand Rapids, Minn., north, has been completed as far as Campton, Minn., about 20 miles. The road will probably be extended further north next season.

T. C. Hampton, of Atlanta, Ga., represents a company which proposes to construct a road from Cumming, Ga., south to a point on the Richmond & Danville near Duluth, Gwinnett County, a distance of about 17 miles, and the citizens of the former place are trying to raise a fund of $20,000, of which one-half is already subscribed.

John Ferguson, of Greenville, S. C., and others are agitating the project to build a railroad from Easleys, on the Richmond & Danville, northwest to Pickens C. H., a distance of about eight miles.

It is said that a charter will soon be obtained for the construction of a railroad to extend from Collinsville, Madison County, north and west to Alton, Ill., a distance of about 20 miles, and that a survey will be made and right of way obtained at once. The line covers a 5 ft vein of coal all the way from Collinsville to a point near Alton, and will intersect the Belt Line road, connect with 17 trunk lines entering East St. Louis, and also with the Merchants' Bridge. Doctor Powell, of Collinsville, and Judge Erwin, of Edwardsville, are interested.

The final survey has been completed for a railroad to extend from Oviedo, Fla., on the Jacksonville, Tampa & Key West, southeast to Rock Ledge, a distance of about 40 miles, and it is reported that work will commence Nov. 1.

Norfolk & Western.—The bridge over the Ohio River at Kenova, W. Va., on the extension from that place to Elkhorn, W. Va., is nearing completion, and will be ready for use by Nov. 1. Track has been laid from Kenova, Wayne County, south to Ferguson, 35 miles, and from Elkhorn, McDowell County, the southern terminus, north toward Kenova, a distance of 30 miles. Grading is in progress between the two ends of track, and it is expected to have the entire line ready for trains next spring.

Ohio River.—The company has advertised for bids for furnishing the piling and timber for the extension of the line from Huntington to the Big Sandy River. Work on the bridge over Guyandotte River is now progressing rapidly, the piling having all been driven for the piers, and the abutments, fills and approaches being well under way.

Pittsburgh, Cincinnati, Chicago & St. Louis.—Engineers are surveying a line from New Cumberland, W. Va., northwest along the east bank of the Ohio River to the mouth of Big Yellow Creek. This will bring the road within seven miles of East Liverpool, O., and an effort is being made to induce the company to continue the road up the river to Rock Springs, a point opposite East Liverpool.

Pittsburgh, Ohio Valley & Cincinnati.—Work is progressing on the section extending from Bellaire south to Powhatan, O., 18 miles, and the contractors, the J. C. Gibney Co. and Miller & Stoehr, have about completed the grading. The line between Powhatan and Marietta, O., about 50 miles, has all been located, but no work commenced.

Portland & Rumford Falls.—The company has advertised for bids for the construction of the road from Canton northwest to Rumford Falls, Me., a distance of about 17 miles. Hugh J. Chisholm, of Portland, Me., is President.

Potomac Valley.—Tracklaying has been begun on this 14-mile extension of the Western Maryland from Williamsport, Md., to a connection with the Baltimore & Ohio at Cherry Run, W. Va. It is expected the road will be open for traffic in about 60 days.

Ravenswood, Spencer & Glenville.—Tracklaying has been begun on the section from Leroy, W. Va., the present terminus, to Spencer, 17 miles, and grading forces have commenced work near the latter place. The portion from Ravenswood to Leroy, a distance of 17 miles, has been in operation since last spring, and the company expects to have trains running over the entire distance by Jan. 1, next.

Roanoke & Southern.—Tracklaying has been completed from Roanoke, Va., south toward the Staunton River for a distance of 13 miles. Grading was completed on this section in the early part of July.

It is expected that the work on the last section of the road, from Martinsville north to Roanoke, Va., a distance of 60 miles, will be completed by Dec. 1.

Seaboard & Augusta.—This road has been chartered in Georgia to build a railroad from Augusta to some point on the Florida state line, near Tallahassee or Tampico, Fla. The incorporators are: T. C. Hogue, Jesse Thompson, F. B. Pope, C. E. Smith, and G. E. Lyndon.

Seattle & Tacoma Air Line.—Preliminary surveys for this road, which is projected to extend from Tacoma north to Seattle, Wash., have been completed. The route lies along the divide between the Dwamish and White River Valleys. The line is several miles shorter than that of the Northern Pacific between these cities.

Southern Pacific.—The Oregon & California, which is the corporate name of the company owning the principal Southern Pacific lines in Oregon, has filed with the state authorities at Salem papers describing numerous lines over which it is intended to build new roads, and also containing a clause stating that the object of the company is to purchase the Oregonian and the Portland & Willamette Valley roads. As these roads are already controlled by Southern Pacific interests the proposed purchase is doubtless a mere formality; but the document filed seems, from the press dispatches, to be intended also to claim authority to build extensions of the lines southward, as will be seen by the following extract:

"From Portland along the Willamette River by way of Silverton, Coberg and Springfield and the middle fork of the Willamette River to the boundary line between Oregon and California, and also from Portland south along the west side of the Willamette River to Airlie, Polk County, and thence to the southern boundary of Oregon. Branches will be run as follows: From Silverton to Woodburn, from a suitable point on Howell's Prairie, between Silverton and Macteay, to the Waldo Hills; from a point opposite Sciotoscio, Yamhill County, west to Sheridan; from a point near Dayton, Yamhill County, to Dayton, and such other branches as may be necessary. Also to purchase the Oregonian Railway and the Portland & Willamette Valley with all their property."

The extension of the road from Los Banos to Armona, Cal., has been completed, and the present daily passenger service in operation from Tracy to Los Banos will be extended to Lanzin, 30 miles south. This point will be the terminus of the western division, and from here on to Armona the line will be part of the Visalia division, over which a mixed train will be run every other day.

South Florida.—The contract for the extension of the road from Pemberton, Fla., north to near High Springs, a distance of about 90 miles, has been awarded to Morgan, Reynolds & Walker, of Lakeland, Fla.

Susquehanna.—The surveys for this road, to extend from Costello, Potter county, Pa., in a southerly direction to Hulls, on the East Fork of the Sinnemahoning, a distance of 14 miles, have been completed, and the contract for building let to D. A. Crage. The maximum grade will be 60 ft. to the mile. There are no important bridges on the route.

Texas, Louisiana & Eastern.—The contractors, Clay & Young, of Clay, Tex., have completed three miles of grading on this line, which is projected to extend from Conroe east to some point in Liberty County, Tex., a distance of about 40 miles; and they expect to have trains running by Oct. 1. A round house is being built at Conroe.

Tobacco Belt & Florida.—This company has been incorporated in Georgia, with a capital of $50,000, to build a railroad from a point on the Savannah, Florida & Western, between Climax and Faceville, to the Florida state line in Decatur County, Ga. Among the incorporators are: M. Nicholson, T. W. Lester, G. P. Wood and C. H. Thomas.

Toledo, Walhonding Valley & Ohio.—Grading has been begun on this road, which it is proposed to build between Loudonville, on the Pittsburgh, Fort Wayne & Chicago, and Coshocton, O., a distance of 46 miles.

Unaka & Nola Chucky.—Nearly all of the right of way has been obtained and $150,000 in town and county bonds secured for the construction of this line from Erwin, Tenn., southwest via Embreeville to Newport, Tenn., 55 miles. The work will be moderately heavy, with light grades and curves, and the route is down the Nola Chucky Valley and along the Unaka Mountains, paralleling the iron belt of East Tennessee. There will be one bridge 400 ft. and another 600 ft. long. It is expected contracts for construction will be let about Nov. 1. The principal business of the road when built will be the transportation of iron, timber and agricultural produce and it will connect the Charleston, Cincinnati & Chicago with the Western North Carolina road. Hamblain County, Tenn., has voted to issue $25,000 in bonds to aid in the construction of this road.

Utah & Wyoming.—The survey has been completed and grading has commenced on this line, extending from Salt Lake City some 200 miles eastward. The line runs through Emigration cañon, Parley's Park and down Silver Creek to Wanship, and along the Weber River to Coalville, thence up Chalk Creek to the Summit of the divide, to Bear River and Hay Creek, where the divide will be crossed; thence to Twin Creek where the survey of the transcontinental line said to be in the interest of the Burlington & Missouri River will be met. The maximum grade is 2 per cent., and the maximum curvature is 8 degrees. The territory through which the road runs is rich in coal, building stone, timber, live stock and agricultural products and there are unlimited mining possibilities. Branches to Park City and Grass Creek coal fields and to Evanston by way of Yellow Creek are contemplated. There will will be six tunnels in Emigration cañon, the longest of which will be 3,500 ft. and the shortest 92 ft. This company was organized about six weeks ago. Wyoming & Eastern is the name of the company proposing to connect with the main line at Twin Creek.

West Virginia & Pittsburgh.—Work on the Gauley River extension has been abandoned till next spring, when that part of the line will be finished. It was seen that the work could not be completed until after the cold weather had set in, and it was deemed advisable not to proceed with the construction and attempt to haul provisions and supplies over the very bad country roads that exist in that section.

Zuni Mountain.—This company has been incorporated in New Mexico to build a railroad from a point at or near Chaves, Bernalillo County, in a southwesterly direction to coal fields in the southern part of Valencia County, a distance of about 75 miles. The capital stock is $1,000,000.

GENERAL RAILROAD NEWS.

Astoria & South Coast.—This road, extending from Smith's Point below Astoria, to Clatsop Beach, Or., a distance of 17 miles, has been purchased by the Southern Pacific. The sale was made to R. Koehler and J. C. Stubbs, who acted as agents for the company, for $54,000, $50,000 cash and the assumption of $4,000 indebtedness. About Jan. 1 last this road was sold to D. P. Thompson, of Portland, Or., for $50,000; and about six months ago J. H. Smith, a railroad contractor, assumed quasi possession of the road and six residents of Astoria went security for the amount. The present transfer releases these six men and reimburses J. H. Smith.

Atchison, Topeka & Santa Fe.—The operations of the company for July, 1891, compared with the corresponding month of last year, are shown in the following statement:

Atchison system:	1891.	1890.	Inc. or Dec
Gross earnings	$2,945,878	$2,549,455	I. $396,423
Oper. expenses	2,109,090	1,960,695	I. 148 395
Net earnings	$836,788	$588,760	I. $248,028
'Frisco system:	1891.	1890.	Inc. or Dec.
Gross earnings	$708,995	$684,733	I. $24,262
Oper. expenses	463,654	415,287	I. 48,366
Net earnings	$245,341	$269,446	D. $24,105
Entire system:	1891.	1890.	Inc. or Dec.
Gross earnings	$3,654 873	$3,234,188	I. $420,685
Oper. expenses	1,572,744	2,375,983	I. 196,761
Net earnings	$1,032,129	$858,205	I. $223,924

The statement of the Colorado Midland road for the month of July shows:

	1891.	1890	Inc. or Dec.
Mileage	350.42	287.77	62.65
Gross earnings	$173,347	$155,195	I. $18 152
Oper. expenses	133,255	99 238	I. 34,017
Net earnings	$40,092	$55,957	D. $15.865

Brooklyn Elevated.—The earnings and operations of the company for the quarter ended June 30 are shown in the following table:

	1891.	1890.	Increase.
Gross earnings	$460 767	$436,271	$4.496
Operating expenses	251,298	246.700	4,598
Net earnings	209,469	189,571	19,898
Other income	2.896	1,657	1,239
Gross income	212.365	191,228	21,137
Fixed charges	159,897	150,701	9.893
Net income	52.468	41,224	11,244

The general balance sheet shows resources of $26,346,123, including $26 163,994 cost of road and equipment and $23.937 cash on hand. The liabilities of $26,346,123 include $1,328,380 capital stock, $12,625,000 funded debt and $157,873 surplus.

Buffalo, Rochester & Pittsburgh.—The annual report of the company for the year ending June 30 shows: Gross earnings, $2,419,407; operating expenses, $1,698,246; net earnings, $721,161; other income, $30,673; fixed charges, $677,372; net income, $74,462; total surplus June 30, $94,517. The gross earnings for August, 1891, were $262,166, against $195,406 for the corresponding month of 1890, an increase of $66,700.

Canadian Pacific.—The gross earnings of the road for July, 1891, were $1,680,592; operating expenses, $1,018,171; and net earnings, $662,421, against $640,361 for the same month in 1890, an increase of $22,060. For the seven months, Jan. 1 to July 1, 1891, the gross earnings were $10,712,057; operating expenses, $7,095,113; and net earnings, $3,616,944, against $2,863,736 for the corresponding period of last year, an increase of $753,208.

Great Northern.—The gross earnings for August, 1891, were $986,575, against $889,339 for the same month of last year, an increase of $97,236. For the eight months to Aug. 31, the gross earnings were $7,334,526, against $6,428,929 for the corresponding period of the last fiscal year, an increase of $905,597.

Kansas City, Fort Scott & Memphis.—The statement of the operations of the road for July, 1891, compared with the corresponding month of last year, is as follows:

	1891.	1890.	Inc. or dec.
Gross earnings	$349.062	$368,748	D. $19.686
Operating expenses	266,722	279.624	D. 12,902
Net earnings	$82.340	$89,124	D. $6,784
Fixed charges	89,011	89,129	D. 118
Deficit	$6,671	$5	L. $6,666

Louisville & Nashville.—The following is the statement of the road for the year ending June 30, 1891, compared with the preceding fiscal year:

	1891.	1890.	Inc. or dec.
Gross earnings	$19,220,729	$18,846,003	I. $374,726
Operating expenses	12,058,445	11,419,092	I. 639,353
Net earnings	$7,162,284	$7,426,921	D. $264,637
Inter., taxes, rentals	4,618.438	4,922.415	D. 303,977
Balance	$2.513,846	$2,504,496	I. $39,350
Other income	747,874	638,686	I. 79,188
Total	$3,261,720	$3,143,182	I. $118,538
Loss Ga. R. R.	.....	.....	D. 90,338
Loss Ala. Mid. R. R	15,502	.....	I. 15,502
Loss Pen. & Atl. R. R.	189,902	187,202	I. 2,790
Total loss	$205,491	$277,540	D. $72,046
Balance	3,056,226	2,865,642	I. 190,584
Dividend (5%)	2,400,000	2,406,483	D. 6,483
Surplus	$656,226	$459,159	I. $197,067

Mexican Central.—The statement of the road's operations for the month of July and for the first seven months of the current year, shows, comparatively, as below:

Month of July:	1891.	1890.	Increase.
Mileage	1,803	1,527	276
Gross earnings	$637,315	$451,503	$186,312
Operating expenses	456,908	318,301	138,607
Net earnings	$180,907	$133,202	$47,705
Since Jan. 1:			
Mileage	1,567	1,527	40
Gross earnings	$4 025,152	$3,660,013	$365,139
Operating expenses	2,597,195	2,465,628	131,567
Net earnings	$1,427,957	$1.194,385	$233,572

New York Central & Hudson River.—The gross earnings of the company for August, 1891, were $4,046,503, against $2,843,522 for the corresponding month of 1890, an increase of $1,202,981. The Rome, Watertown & Ogdensburg last month earned $373,077, which is included in the above. August, last year, was the month of the strike.

New York, Pennsylvania & Ohio.—The report of the earnings of the road for the quarter ended June 30,

as compared with the corresdonding period of the last fiscal year, is as follows:

	1890.	1891.	Inc. or dec.	
Gross earnings	$514,980	$511,656	D.	$23,676
Operating expenses	13,258	14,243	D.	985
Net earnings	$501,722	527,413	D.	$25,691
Other income	5,576	5,621	D.	45
Total income	$507,298	$133,031	D.	$25,736
First charges	335,716	334,884	I.	832
Surplus	$171,582	$198,150	D.	$26,568

New York, Susquehanna & Western.—The operations of the road for the seven months ending July 31, make the following comparison with 1890:

	1891.	1890.	Increase.
Gross earnings	$910,632	$860,160	$50,552
Oper. expenses	515,379	495,426	19,953
Net earnings	$395,303	$364,734	$30,569

Ogdensburgh & Lake Champlain.—From the annual report of the Ogdensburgh & Lake Champlain and the Saratoga & St. Lawrence it is shown that there were $266,073 passengers and 1,023,654 tons of freight carried. The gross earnings from operation were $800,181; operating expenses, $586,499; other income, $7,180; fixed charges, $263,740; deficit for year, $42,877; total deficit June 30, $84,160.

Texas Central.—The parties who bought this road at foreclosure sale on April 22 last have complied with the terms prescribed by the court and expect to soon take possession The line begins at Ross, Tex., 10 miles northwest of Waco, and terminates at Albany, Tex., 190 miles northwest of Waco. The purchasers are: Charles Moran, Cornelius B. Gould and Henry K. McHarg, of New York. The Houston & Texas Central has continued in control up to the present time. Charles Hamilton, General Manager, Robert Bell, the General Freight and Passenger Agent, and Miss Rosa Bell, Secretary, have arrived in Waco and established offices at Fifth street and Austin avenue.

Toledo, St. Louis & Kansas City.—Judge Gresham, of the United States Court, in considering an application for a receiver a few months ago, gave the company until Sept. 4 to pay up old claims against the road aggregating $200,000. This was done last Friday, and the case is now out of the court.

Union Pacific.—The directors last week ratified the deed of trust under which the collateral for the new notes to take up the floating debt of the company was deposited, and the formal agreement was then signed by the Creditors' Committee. It is said that over three-fourths of the creditors have already agreed to extend their claims. This deed places the securities now in the treasury of the company in the charge of Drexel, Morgan & Co., the liquidation of the three year notes to be issued in exchange for the present unfunded obligations to be conducted by the Creditors' Committee. This committee is composed of J. Pierpont Morgan, John A. Stewart, Edward King, Alexander E. Orr and Frederick L. Ames.

Winona Bridge.—Trains have begun running regularly over the new bridge which spans the Mississippi River at Winona, Wis. The construction of the bridge was begun Aug. 1, 1890, by the Winona Bridge Railway Co., a corporation controlled jointly by the Chicago, Burlington & Northern, Green Bay, Winona & St. Paul and Winona & Southwestern. The cost of the structure was about $450,000. The bridge has four spans, and with the approaches is about 2,700 ft. in length. It forms the connecting link between the Green Bay, Winona & St. Paul and Winona & Southwestern, the latter being the road now in course of construction from Winona to Omaha, and is now completed and in operation from Winona to Osage, a distance of 113 miles.

TRAFFIC.

Chicago Traffic Matters.

CHICAGO, Sept. 9, 1891.

The Commissioners of the Western Traffic Association, with the exception of Commissioner Faithorn, were in session Sept. 3, 4 and 5, hearing various matters which have been referred to them for consideration. The most important was the application of the Southern Pacific for relief from the action of the Delaware, Lackawanna & Western and its western connections, which it is alleged have been paying such excessive commissions on west bound immigrant traffic that the Atlantic system of the former is not able to secure its fair share of the business. The hearing resulted in a general discussion of the question of commissions on trans continental traffic, and the adoption of a resolution, subject to ratification by absent lines and by the Advisory Board of the Western Traffic Association, providing for a permanent committee to take charge of the subject of what commissions, if any, shall be paid on trans-continental business.

The meeting of the Western Passenger Association just concluded was harmonious—quite so. The only action taken was the granting of a rate of fare one way for the unveiling of the Grant monument in Chicago, Oct. 8. Other matters were tabled. The old chestnut of "week end" tickets was taken up, but as every member wanted to put in nearly all the stations on his line the matter was promptly tabled with the rest.

The Chicago & Ohio River Association will join the Central Traffic Association in the "Home Visitors" excursion from western points to Central Traffic territory, Sept. 22. Invitations have been extended to the Western Passenger, Trans-Missouri Passenger and Trans-Continental associations to join in a one-fare round-trip rate, and it is likely that it will be done, although there is not a unanimous agreement on the matter as yet.

The Chicago & Eastern Illinois has been caught in a manipulation of rates upon coal from Brazil, Ind., to northwestern points, which has been going on for some time. An arrangement has been in effect with that line since Dec. 19, 1887, whereby a through rate on coal was established from Danville, Ill., 15 cents higher than the Chicago rate. The rate from Chicago to St. Paul is $1.75 per net ton. The local rate from Brazil to Chicago is $1 per net ton. On business from Danville under the agreement the lines north of Chicago agreed to accept $1.35 per net ton on the through billing of $1.90 per ton, but this rate and division was limited strictly to coal from Danville. The Chicago & Eastern Illinois, instead of shipping the Brazil coal via Chicago, has been carrying it to Danville on a local rate of 45 cents per net ton and rebilling from there on the through rate of $1.90, thus cutting the rate from Brazil to St. Paul 40 cents per ton. The matter has been up several times and has been fixed up in one way and another, but recently the complaints became so urgent that a thorough investigation was ordered, which has been made by Chairman Midgley, with the result that he has ordered the cancellation on Sept. 18 of all through tariffs on coal from Danville to points in the Northwest.

The northwestern and eastern lines came to no agreement regarding the passenger competition of the "Soo" line. The "Soo" wants a differential of $1.50 via Mackinaw as against Chicago, but does not want to make any terms on business via Sault Ste. Marie. One of the northwestern lines steadily voted "no" to any proposition to allow the "Soo" a differential, and consequently the meeting adjourned without action.

A plan is being formulated by the Commissioners of the Western Traffic Association and a committee of general passenger agents having in view the possible merging of the Western Passenger Association directly into the Western Traffic Association as a division of the latter and remodelling the agreement of the Passenger Association to conform to that of the Western Traffic Association.

The Freight Committee of the Central Traffic Association in session this week. Among the subjects for consideration are: Report on the proposed elimination of insured bills of lading on traffic from St. Louis to the East via lake and rail and rail and sea; consideration of the request of the Independent Refiners and Oil Shippers' Association for a general reduction in oil tariffs; differential rates from Milwaukee via lake and Benton Harbor, Grand Haven and other ports to central traffic and trunk line points.

The regular meeting of the Western Freight Association is also being held this week. Among the more important subjects under consideration are: Free storage; switching charges at Chicago; collection of charges upon interstate shipments of liquor seized in Iowa; rates and divisions between St. Louis and Lake Superior ports.

The Erie has commenced running second-class sleepers between Boston and Chicago similar to those in use for some time on the Southern Pacific. This is the first attempt to run these cars regularly east of Chicago.

Lake rates remain firm and advancing. Three cents a bushel for corn to Buffalo and 3¼ cents for wheat is freely bid and it is reported that in some instances higher rates have been paid. The lake and rail lines have given notice of an advance in grain rates to New England, taking effect Sept. 14. The new figures are 12 cents a bushel for wheat, 10½ cents for corn and 7 cents for oats. The advance is 1 cent on wheat and ¼ cent for corn.

Traffic Notes.

The Fish Commissioners of Ohio have a new car, specially constructed for the transportation of live fish; it has a tank 39 ft. long and a living room and kitchen for the attendant.

The Philadelphia & Reading claims to be delivering at Philadelphia more grain than comes by the Pennsylvania. This traffic comes to the Reading at Williamsport, to which place it is brought by the Falls Brook Coal Co.'s road, which receives it at Lyons and Corning.

The Chicago & Ohio River lines have agreed to advance passenger rates from Cincinnati, Louisville, Indianapolis and adjacent territory to Pacific Coast points by basing them on the rates from the Missouri River. This will effect an advance in the rate to San Francisco of $7 first class and $5 second class.

The flour mills in Chattanooga, Tenn., have been granted the milling in transit privilege by the railroads which make through rates from the northwest to Georgia points. The millers had threatened to establish a boat line from St. Louis, which would bring grain to Chattanooga in competition with the railroads.

Seven carriage manufacturers of Cincinnati last week applied to the United States Court for an injunction restraining the railroads using the official classification from increasing the rates on carriages according to a new classification just issued, which has the effect of raising the rates on this class of goods about 33⅓ per cent. The court, however, declined to enjoin such a large aggregation of defendants.

The Texas Railroad Commissioners have issued their third general commodity tariff. It applies on lumber, lath and shingles in carloads of 12 tons, and the rate for 25 miles is 6 cents per 100 lbs.; for 100 miles, 14 cents; for 500 miles, 23 cents. There are a number of local exceptions, but none of them seemed to be based on the volume of general business done by the road. Lumber may be stopped off for planing, on payment of $5 per car.

Rail and lake rates from New England seem to have got beyond all control, and changes are announced faster than they can be recorded. The Fitchburg issued on Monday a tariff making the rate on first class from Boston to Chicago 30 cents per 100 lbs, a reduction of three cents from the last tariff. The rates to Chicago, Milwaukee, Green Bay and Gladstone, on business destined to points beyond not otherwise covered by through lake rates, to which the reduced proportions of all rail rates apply, are 27 cents first class, 21 cents second class, etc.

A joint conference of lake and rail lines to consider eastbound rates from Milwaukee has adopted the following resolution: *Resolved*, That the present differential rates via cross lake lines to trunk line territory formed and made by all across lake lines and to points in the Central Traffic Association territory east of the Indiana and Illinois state line, and a combination of such north and south to the Ohio River territory at Evansville shall be established by all across lake lines on the basis of 6, 5, 4, 3, 2 cents per 100 lbs. less than established all rail rates from Milwaukee.

A Little Rock dispatch states that the Missouri Pacific has virtually abolished smoking on all of its passenger trains in that region. When the separate car law went into effect the colored coach was placed next to the baggage car, a "divided" car was placed next, and the first-class white coach behind. The divided car was used as a smoker, the members of each race using their respective portions of the car. But for some reason this is not satisfactory, and an order has been issued instructing all conductors not to permit any smoking on any train in Arkansas or Louisiana, except in the smoking-room of sleepers and chair cars. It is regarded as one of the means adopted to make the people sick of the separate coach law.

A negro passenger riding westward in a sleeping car on the Southern Pacific recently, was forced to change into the negro car when the train passed into the state of Texas. He at once made complaint and it appears was told by the State Railroad Commissioners of Texas that, his journey being inter-state, his ejection from the sleeping car was unlawful. Press despatches have stated that this decision emanated from the Inter-State Commerce Commission, but such is not the fact. The Southern Pacific has instructed its conductors in Texas as follows:

"Colored people making inter-state trips have a right to accommodation in all sleeping and chair cars if they can secure first-class tickets of the agents. But where colored people are making local state trips they are not entitled to sleeping or chair cars under any consideration unless the car is placed in the train and held exclusively for colored passengers."

The I. I. I.

The facts in respect to the relations of the Indiana, Illinois & Iowa road to its western connections, about which conflicting statements have appeared in the daily papers, are as follows: That company is favorably situated as a connecting link between the Western and Eastern lines from Streator and Dwight, Ill., eastward to La Porte, Ind., New Buffalo, Ind., and other points. The road is straight and quick time is made, especially with through freight in carloads. The through mileage is less than by the route via Chicago, from Kansas City to the seaboard. These conditions led the western connections of the "I. I. I.," when it came into the field not many years ago, to accord it favorable divisions, as it reduced their own expenses and improved the service. The western connections referred to are the Chicago, Burlington & Quincy, Chicago & Alton and Atchison, Topeka, & Santa Fé. No other western road has a connection with the I. I. I. Kankakee, Ill., an intermediate point on the I. I. I., takes Chicago rates from the Missouri River, and the western roads named allowed the new line a liberal division for its haul to that point.

Subsequently the I. I. I. secured a similar arrangement from its eastern connections whereby it received a favorable division of the through rates between the Mississippi River and the seaboard. These arrangements work in both directions, and in effect the addition of the divisions received from the eastern lines and those received from the western lines give the I. I. I. a large proportion for its comparatively easy haul, in addition to the natural advantages enjoyed. It is alleged, and generally believed, that in introducing the line the I. I. I. in some way made concessions to shippers out of the double divisions which it received. At any rate it was able to control the routing of the traffic to a very large degree, and many leading shippers have insisted upon that route being pursued by their freight. In this it is assisted by the fact that the Chicago & Alton has season contracts with large shippers of dressed beef and packing house products from Kansas City. The lines via St. Louis being deprived of this traffic met the I. I. I. competition during last winter and spring in some way not disclosed, and secured a considerable proportion of the business. In May, however, the lines running east from St. Louis harmonized their differences among themselves, and have since maintained their rates, the result being a restoration of a very heavy traffic to the I. I. I. Other Chicago lines than those above mentioned, such as the Chicago, Milwaukee & St. Paul, Chicago & Northwestern, etc., claim to be excluded from a participation in the business, and unite with the St. Louis lines in a very urgent demand that a remedy be found. The subject assumed so much importance that it was taken up in the Advisory Board of the Western Traffic Association and the Commissioners were directed to find some method whereby the through rates could be so equalized that a fair distribution of the business could be had. Efforts at adjustment by negotiation between the western and eastern lines, through the Joint Rate Committee, had failed. The matter was heard before the Commissioners at their session in August and is now under consideration by them.

Meanwhile the I. I. I. a short time since filed a formal application for admission to the Western Freight Association. This move, if not made at the request of the Burlington and other lines with which it connects on the west, is favored by them, and they express the opinion that the bringing of this road into the Western Freight Association will give that organization a supervision over its methods sufficient to put an end to the charge of employing illegitimate practices for obtaining traffic. The other lines, however, observe that the application covers only that part of the line of the I. I. I. west of Kankakee, and claim that while the eastern part of the line is not subject to association control there can be no security. They further claim that the admission of the I. I. I. to the association unaccompanied by a correction of the double divisions received by that route will only intensify and perpetuate the present troubles; that the divisions made between lines members of the Western Freight Association have heretofore been optional with such lines, and that the adjustment of divisions must be corrected before the I. I. I. line can safely be admitted to membership.

A vote by letter is now being taken in the Western Freight Association, and several members have voted against the application. Chairman Midgeley rules that a unanimous consent is necessary for the admission of a new line to membership. This ruling is contested by the Burlington. The agreement is silent upon the subject, and the point is one to be determined by the association as a whole if an appeal is taken from the chairman's ruling.

Eastbound Shipments.

The shipments of eastbound freight from Chicago by all the lines for the week ending Sept. 5 amounted to 55,950 tons, against 50,794 tons during the preceding week, an increase of 5,156 tons, and against 71,303 tons during the corresponding week of 1890, a decrease of 15,353 tons. The proportions carried by each road were:

	Wk. to Sept. 5.		Wk. to Aug. 29	
	Tons.	P. c.	Tons.	P. c.
Michigan Central	9,182	16.4	6,510	12.8
Wabash	3,655	6.5	3,195	6.3
Lake Shore & Michigan South.	6,482	11.6	7,587	14.9
Pitts., Ft. Wayne & Chicago	5,549	9.9	5,296	10.4
Pitts., Cin., Chicago & St. L	5,788	10.4	5,778	11.4
Baltimore & Ohio	3,748	6.7	3,749	7.4
Chicago & Grand Trunk	5,535	9.9	5,285	10.4
New York, Chic. & St. Louis	7,227	12.9	5,761	11.3
Chicago & Erie	8,784	15.7	7,631	15.1
Total	55,950	100.0	50,794	100.0

Of the above shipments, 1,961 tons were flour, 22,906 tons grain, 1,948 tons millstuff, 4,538 tons cured meats, 8,623 tons dressed beef, 1,334 tons butter, 1,725 tons hides, 6,266 tons lumber. The three Vanderbilt lines carried 40.9 per cent., the two Pennsylvania lines 20.3 per cent. The lake lines carried 102,127 tons, against 119,266 tons during the preceding week, a decrease of 17,139 tons.